



CERTIFICATION TEST REPORT

Report Number. : 13018918-E7V2

Applicant : APPLE, INC
1 APPLE PARK WAY.
CUPERTINO, CA 95014, U.S.A

Model : A2296

FCC ID : BCG-E3501A

IC : 579C-E3501A

EUT Description : SMARTPHONE

Test Standard(s) : FCC CFR47 PART 22H, 24E, 27L AND 90S
ISED RSS-132 ISSUE 3, RSS-133 ISSUE 6 AND
RSS-139 ISSUE 3

Date Of Issue:
MARCH 24, 2020

Prepared by:
UL Verification Services Inc.
47173 Benicia Street
Fremont, CA 94538, U.S.A.
TEL: (510) 319-4000
FAX: (510) 661-0888



Revision History

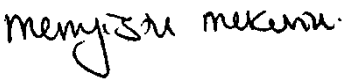
Rev.	Issue Date	Revisions	Revised By
V1	2/11/2020	Initial Issue	Lieu Nguyen
V2	3/24/2020	Addressed TCB feedback	John Thompson

TABLE OF CONTENTS

1. ATTESTATION OF TEST RESULTS	5
2. TEST METHODOLOGY	6
3. FACILITIES AND ACCREDITATION	6
4. DECISION RULES AND MEASUREMENT UNCERTAINTY	7
4.1 METROLOGICAL TRACEABILITY	7
4.2 DECISION RULES	7
4.3 MEASUREMENT UNCERTAINTY	7
5. EQUIPMENT UNDER TEST	8
5.1 DESCRIPTION OF EUT	8
5.2 MAXIMUM OUTPUT POWER	8
5.2.1 LAT 1	9
5.2.2 UAT 1	11
5.3 SOFTWARE AND FIRMWARE	13
5.4 MAXIMUM ANTENNA GAIN	13
5.5 WORST-CASE CONFIGURATION AND MODE	13
5.6 DESCRIPTION OF TEST SETUP	14
6. TEST AND MEASUREMENT EQUIPMENT	16
7. RF OUTPUT POWER VERIFICATION	17
7.1 GSM	17
7.2 CDMA	19
7.3 WCDMA	25
8. CONDUCTED TEST RESULTS	30
8.1 OCCUPIED BANDWIDTH	30
8.1.1 GSM	32
8.1.2 CDMA	33
8.1.3 WCDMA	34
8.2 BAND EDGE AND EMISSION MASK	35
8.2.1 GSM	37
8.2.2 CDMA	39
8.2.3 WCDMA	42
8.3 OUT OF BAND EMISSIONS	45
8.3.1 GSM	46
8.3.2 CDMA	48
8.3.3 WCDMA	51
8.4 FREQUENCY STABILITY	54
8.4.1 GSM	55

8.4.2.	CDMA2000.....	56
8.4.3.	UMTS.....	57
8.5.	PEAK-TO-AVERAGE POWER RATIO.....	59
8.5.1.	GSM.....	60
8.5.2.	CDMA.....	61
8.5.3.	WCDMA.....	62
9.	RADIATED TEST RESULTS.....	63
9.1.	FIELD STRENGTH OF SPURIOUS RADIATION, LAT 1.....	63
9.1.1.	GSM.....	64
9.1.2.	CDMA.....	68
9.1.3.	WCDMA.....	74
9.2.	FIELD STRENGTH OF SPURIOUS RADIATION, UAT 1.....	80
9.2.1.	GSM.....	80
9.2.2.	CDMA.....	84
9.2.3.	WCDMA.....	90
10.	SETUP PHOTO.....	96

1. ATTESTATION OF TEST RESULTS

Applicant Name and Address	APPLE, INC 1 APPLE PARK WAY. CUPERTINO, CA 95014, U.S.A
Model	A2296
FCC ID	BCG-E3501A
IC	579C-E3501A
EUT Description	SMARTPHONE
Serial Number	FFMZW06XPM62,FFMZW038PM62
Date Tested	SEPTEMBER 3, 2019 to OCTOBER 25, 2019
Applicable Standards	FCC CFR 47 Part 22H, 24E, 27L, AND 90S ISED RSS-132 ISSUE 3, RSS-133 ISSUE 6, AND RSS-139 ISSUE 3
Test Results	COMPLIES
UL Verification Services Inc. tested the above equipment in accordance with the requirements set forth in the above standards. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report. The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. It is the manufacturer's responsibility to assure that additional production units of this model are manufactured with identical electrical and mechanical components. All samples tested were in good operating condition throughout the entire test program. Measurement Uncertainties are published for informational purposes only and were not taken into account unless noted otherwise. This document may not be altered or revised in any way unless done so by UL Verification Services Inc. and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by UL Verification Services Inc. will constitute fraud and shall nullify the document. This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, any agency of the Federal Government, or any agency of the U.S. government.	
Approved & Released By: 	Prepared By: 
Mengistu Mekuria Senior Test Engineer UL Verification Services Inc.	Lieu Nguyen Laboratory Engineer UL Verification Services Inc.

2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with the following:

- ANSI C63.26:2015
- FCC CFR 47 Part 2, Part 22, Part 24, Part 27 and Part 90
- FCC KDB 971168 D01 v03r01: Power Meas License Digital Systems
- FCC KDB 971168 D02 v02r01: Misc Rev Approv License Devices
- FCC KDB 412172 D01 v01r01: Determining ERP and EIRP
- ISED RSS-132 Issue 3, RSS-133 Issue 6, RSS-139 Issue 3.

3. FACILITIES AND ACCREDITATION

The test sites and measurement facilities used to collect data are located at 47173 and 47266 Benicia Street, and 47658 Kato Road, Fremont, California, USA. The following table identifies which facilities were utilized for radiated emission measurements documented in this report. Specific facilities are also identified in the test results sections.

47173 Benicia Street	47266 Benicia Street	47658 Kato Rd.
☒ Chamber A (ISED:2324B-1)	☐ Chamber D (ISED:22541-1)	☐ Chamber I (ISED: 2324A-5)
☒ Chamber B (ISED:2324B-2)	☐ Chamber E (ISED:22541-2)	☐ Chamber J (ISED: 2324A-6)
☐ Chamber C (ISED:2324B-3)	☐ Chamber F (ISED:22541-3)	☐ Chamber K (ISED: 2324A-1)
	☐ Chamber G (ISED:22541-4)	☐ Chamber L (ISED: 2324A-3)
	☐ Chamber H (ISED:22541-5)	

The above test sites and facilities are covered under FCC Test Firm Registration # 208313. Chambers above are covered under Industry Canada company address and respective code.

UL Verification Services Inc. is accredited by NVLAP, Laboratory Code 200065-0.

4. DECISION RULES AND MEASUREMENT UNCERTAINTY

4.1 METROLOGICAL TRACEABILITY

All test and measuring equipment utilized to perform the tests documented in this report are calibrated on a regular basis, with a maximum time between calibrations of one year or the manufacturers' recommendation, whichever is less, and where applicable is traceable to recognized national standards.

4.2 DECISION RULES

The Decision Rule is based on Simple Acceptance in accordance with ISO Guide 98-4:2012 Clause 8.2. (Measurement uncertainty is not taken into account when stating conformity with a specified requirement.)

4.3 MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus:

PARAMETER	U _{LAB}
Worst Case Conducted Disturbance, 9KHz to 0.15 MHz	3.39 dB
Worst Case Conducted Disturbance, 0.15 to 30 MHz	3.07 dB
Worst Case Radiated Disturbance, 9KHz to 30 MHz	2.52 dB
Worst Case Radiated Disturbance, 30 to 1000 MHz	4.88 dB
Worst Case Radiated Disturbance, 1000 to 18000 MHz	4.24 dB
Worst Case Radiated Disturbance, 18000 to 26000 MHz	4.37 dB
Worst Case Radiated Disturbance, 26000 to 40000 MHz	5.17 dB

Uncertainty figures are valid to a confidence level of 95%.

5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

EUT is a smartphone with multimedia functions (music, application support, and video), cellular GSM, GPRS, EGPRS, UMTS, LTE, TD-SCDMA, CDMA, IEEE 802.11a/b/g/n/ac/ax, Bluetooth, GPS and NFC. All models support at least one UICC based SIM. The second SIM, if present, is either UICC based pSIM (physical SIM) or e-SIM (electronic SIM). The device has a built-in inductive charging receiver. The rechargeable battery is also not user accessible.

5.2. MAXIMUM OUTPUT POWER

ERP/EIRP LIMIT

FCC: §2.1046, §22.913, §24.232, §27.50 and §90.635
IC: RSS132§5.4; RSS133§6.4 and RSS139§6.5.

EIRP/ERP TEST PROCEDURE

ANSI C63.26:2015
KDB 971168 D01 Section 5.6

$$\text{ERP/EIRP} = \text{PMeas} + \text{GT} - \text{LC}$$

where: ERP/EIRP = effective or equivalent radiated power, respectively (expressed in the same units as PMeas, typically dBW or dBm);

PMeas = measured transmitter output power or PSD, in dBm or dBW;

GT = gain of the transmitting antenna, in dBd (ERP) or dBi (EIRP);

LC = signal attenuation in the connecting cable between the transmitter and antenna, in dB.

For devices utilizing multiple antennas, KDB 662911 provides guidance for determining the effective array transmit antenna gain term to be used in the above equation.

EUT includes different power levels for head use configuration and body use configuration and the below tables contain the highest of all configurations average conducted and ERP/EIRP output powers as follows:

5.2.1. LAT 1

GSM MODES

RSS 132 850MHz

Frequency range (MHz)	Modulation	Conducted (Average) (dBm)	Antenna Gain (dBi)	Limit (W)	EIRP		99% BW (kHz)	Emission Designator
					(dBm)	(W)		
824-849	GPRS	32.75	-1.70	11.5	31.05	1.274	247.61	248KGXW
	EGPRS	27.25			25.55	0.359	247.33	247KG7W

Part 22 850MHz

Frequency range (MHz)	Modulation	Conducted (Average) (dBm)	Antenna Gain (dBi)	Limit (W)	ERP		99% BW (kHz)	Emission Designator
					(dBm)	(W)		
824-849	GPRS	32.75	-1.70	7.0	28.90	0.776	247.61	248KGXW
	EGPRS	27.25			23.40	0.219	247.33	247KG7W

Part 24 / RSS 133 1900MHz

Frequency range (MHz)	Modulation	Conducted (Average) (dBm)	Antenna Gain (dBi)	Limit (W)	EIRP		99% BW (kHz)	Emission Designator
					(dBm)	(W)		
1850-1910	GPRS	31.25	-2.00	2.0	29.25	0.841	247.37	247KGXW
	EGPRS	26.25			24.25	0.266	250.69	251KG7W

CDMA MODES

Part 90 BC10

Frequency range (MHz)	Modulation	Conducted (Average) (dBm)	Antenna Gain (dBi)	Limit (W)	ERP		99% BW (kHz)	Emission Designator
					(dBm)	(W)		
816-824	1xRTT	25.2	-2.40	100.0	20.65	0.116	1271.7	1M27F9W
	1xEV-DO Rev A	25.2			20.65	0.116	1265.2	1M27F9W

RSS 132 BC0

Frequency range (MHz)	Modulation	Conducted (Average) (dBm)	Antenna Gain (dBi)	Limit (W)	EIRP		99% BW (kHz)	Emission Designator
					(dBm)	(W)		
824-849	1xRTT	25.2	-1.70	11.5	23.50	0.224	1274	1M27F9W
	1xEV-DO Rev A	25.2			23.50	0.224	1266.9	1M27F9W

Part 22 BC0

Frequency range (MHz)	Modulation	Conducted (Average) (dBm)	Antenna Gain (dBi)	Limit (W)	ERP		99% BW (kHz)	Emission Designator
					(dBm)	(W)		
824-849	1xRTT	25.2	-1.70	7.0	21.35	0.136	1274	1M27F9W
	1xEV-DO Rev A	25.2			21.35	0.136	1266.9	1M27F9W

Part 24 / RSS 133 BC1

Frequency range (MHz)	Modulation	Conducted (Average) (dBm)	Antenna Gain (dBi)	Limit (W)	EIRP		99% BW (kHz)	Emission Designator
					(dBm)	(W)		
1850-1910	1xRTT	24.2	-2.00	2.0	22.20	0.166	1272.3	1M27F9W
	1xEV-DO Rev A	24.2			22.20	0.166	1263	1M26F9W

WCDMA MODE

RSS 132 Band 5								
Frequency range (MHz)	Modulation	Conducted (Average) (dBm)	Antenna Gain (dBi)	Limit (W)	EIRP		99% BW (kHz)	Emission Designator
					(dBm)	(W)		
824-849	REL 99	25.2	-1.70	11.5	23.50	0.224	4067.5	4M07F9W
	HSDPA	25.2			23.50	0.224	4069	4M07F9W
Part 22 Band 5								
Frequency range (MHz)	Modulation	Conducted (Average) (dBm)	Antenna Gain (dBi)	Limit (W)	ERP		99% BW (kHz)	Emission Designator
					(dBm)	(W)		
824-849	REL 99	25.2	-1.70	7.0	21.35	0.136	4067.5	4M07F9W
	HSDPA	25.2			21.35	0.136	4069	4M07F9W
Part 24 / RSS 133 Band 2								
Frequency range (MHz)	Modulation	Conducted (Average) (dBm)	Antenna Gain (dBi)	Limit (W)	ERP		99% BW (kHz)	Emission Designator
					(dBm)	(W)		
1850-1910	REL 99	24.2	-2.00	2.0	22.20	0.166	4065.1	4M07F9W
	HSDPA	24.2			22.20	0.166	4067.9	4M07F9W
Part 27 / RSS 139 Band 4								
Frequency range (MHz)	Modulation	Conducted (Average) (dBm)	Antenna Gain (dBi)	Limit (W)	EIRP		99% BW (kHz)	Emission Designator
					(dBm)	(W)		
1710-1755	REL 99	24.5	-4.10	1.0	20.40	0.110	4068.1	4M07F9W
	HSDPA	24.5			20.40	0.110	4063.7	4M06F9W

5.2.2. UAT 1

GSM MODES

<u>RSS 132 850MHz</u>							
Frequency range (MHz)	Modulation	Conducted (Average) (dBm)	Antenna Gain (dBi)	EIRP		Limit (dBm)	Margin (dB)
				dBm	mW		
824- 849	GPRS	30.75	-2.40	28.35	683.9	40.6	-12.3
	EGPRS	25.25	-2.40	22.85	192.8	40.6	-17.8
<u>Part 22 850MHz</u>							
Frequency range (MHz)	Modulation	Conducted (Average) (dBm)	Antenna Gain (dBi)	ERP		Limit (dBm)	Margin (dB)
				dBm	mW		
824- 849	GPRS	30.75	-2.40	26.20	416.9	38.5	-12.3
	EGPRS	25.25	-2.40	20.70	117.5	38.5	-17.8
<u>Part 24 / RSS 133 1900MHz</u>							
Frequency range (MHz)	Modulation	Conducted (Average) (dBm)	Antenna Gain (dBi)	EIRP		Limit (dBm)	Margin (dB)
				dBm	mW		
1850-1910	GPRS	28.00	1.40	29.40	871.0	33.0	-3.6
	EGPRS	23.75	1.40	25.15	327.3	33.0	-7.9

CDMA MODES

<u>Part 90 BC10</u>							
Frequency range (MHz)	Modulation	Conducted (Average) (dBm)	Antenna Gain (dBi)	ERP		Limit (dBm)	Margin (dB)
				dBm	mW		
816-824	1xRTT	23.50	-2.90	18.45	70.0	50.0	-31.6
	1xEV-DO Rev A	23.50	-2.90	18.45	70.0	50.0	-31.6
<u>RSS 132 BC0</u>							
Frequency range (MHz)	Modulation	Conducted (Average) (dBm)	Antenna Gain (dBi)	EIRP		Limit (dBm)	Margin (dB)
				dBm	mW		
824- 849	1xRTT	23.50	-2.40	21.10	128.8	40.6	-19.5
	1xEV-DO Rev A	23.50	-2.40	21.10	128.8	40.6	-19.5
<u>Part 22 BC0</u>							
Frequency range (MHz)	Modulation	Conducted (Average) (dBm)	Antenna Gain (dBi)	ERP		Limit (dBm)	Margin (dB)
				dBm	mW		
824- 849	1xRTT	23.50	-2.40	18.95	78.5	38.5	-19.5
	1xEV-DO Rev A	23.50	-2.40	18.95	78.5	38.5	-19.5
<u>Part 24 / RSS 133 BC1</u>							
Frequency range (MHz)	Modulation	Conducted (Average) (dBm)	Antenna Gain (dBi)	EIRP		Limit (dBm)	Margin (dB)
				dBm	mW		
1850-1910	1xRTT	19.00	1.40	20.40	109.6	33.0	-12.6
	1xEV-DO Rev A	19.00	1.40	20.40	109.6	33.0	-12.6

WCDMA MODE

RSS 132 Band 5							
Frequency range (MHz)	Modulation	Conducted (Average) (dBm)	Antenna Gain (dBi)	EIRP		Limit (dBm)	Margin (dB)
				dBm	mW		
824- 849	REL 99	23.50	-2.40	21.10	128.8	40.6	-19.5
	HSDPA	23.50	-2.40	21.10	128.8	40.6	-19.5
Part 22 Band 5							
Frequency range (MHz)	Modulation	Conducted (Average) (dBm)	Antenna Gain (dBi)	ERP		Limit (dBm)	Margin (dB)
				dBm	mW		
824- 849	REL 99	23.50	-2.40	18.95	78.5	38.5	-19.5
	HSDPA	23.50	-2.40	18.95	78.5	38.5	-19.5
Part 24 / RSS 133 Band 2							
Frequency range (MHz)	Modulation	Conducted (Average) (dBm)	Antenna Gain (dBi)	EIRP		Limit (dBm)	Margin (dB)
				dBm	mW		
1850-1910	REL 99	19.00	1.40	20.40	109.6	33.0	-12.6
	HSDPA	19.00	1.40	20.40	109.6	33.0	-12.6
Part 27 / RSS 139 Band 4							
Frequency range (MHz)	Modulation	Conducted (Average) (dBm)	Antenna Gain (dBi)	EIRP		Limit (dBm)	Margin (dB)
				dBm	mW		
1710-1755	REL 99	18.50	1.90	20.40	109.6	30.0	-9.6
	HSDPA	18.50	1.90	20.40	109.6	30.0	-9.6

5.3. SOFTWARE AND FIRMWARE

The EUT baseband firmware:19-1.05.18.

5.4. MAXIMUM ANTENNA GAIN

Frequency Range (MHz)	LAT 1 Gain (dBi)	UAT 1 Gain (dBi)
816 - 824	-2.40	-2.90
824 - 849	-1.70	-2.40
1850 - 1910	-2.00	1.40
1710 - 1755	-4.10	1.90

5.5. WORST-CASE CONFIGURATION AND MODE

Radiated test was investigated in three orthogonal orientations X, Y and Z on LAT 1/ UAT 1 on both Cell and PCS bands. It was determined that X(Flatbed) orientation was the worst case orientation for Cell and AWS bands and Z (Portrait) orientation was the worst case orientation for PCS bands without AC/DC adapter. On the other hand, Y (Landscape) orientation was the worst case orientation for Cell, AWS, and PCS bands on UAT1 without AC/DC adapter.

Based on average conducted output power measurement investigations. The worst-case is LAT 1 with the highest power.

Therefore, LAT 1 was used to perform all conducted tests.

The worst-case scenario for all measurements as followed:

Worst-case modes:

- GSM GPRS
- GSM EGPRS
- CDMA 2000 1xRTT
- CDMA 2000 1xEV-DO REV. A
- WCDMA REL 99
- WCDMA HSDPA

CDMA BC10 band is supported in USA only.

Radiated spurious emissions were investigated from 9kHz to 30MHz, 30MHz-1GHz and above 1GHz. There were no emissions found with less than 20dB of margin from 9kHz to 1GHz

For simultaneous transmission of multiple channels in the 2.4GHz/5GH WLAN, UWB, and Cellular bands, tests were conducted for various configurations having the highest power, least separation in frequencies and widest operation bandwidths. No noticeable new emission was found.

5.6. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

Support Equipment List			
Description	Manufacturer	Model	Serial Number
Laptop AC/DC adapter	Apple	85W MagSafe 2	C0651730MMMG6P4AL
Laptop	Apple	Macbook Pro	C02PM012G3QD
Laptop	Apple	Macbook Pro	C02P52HGG085

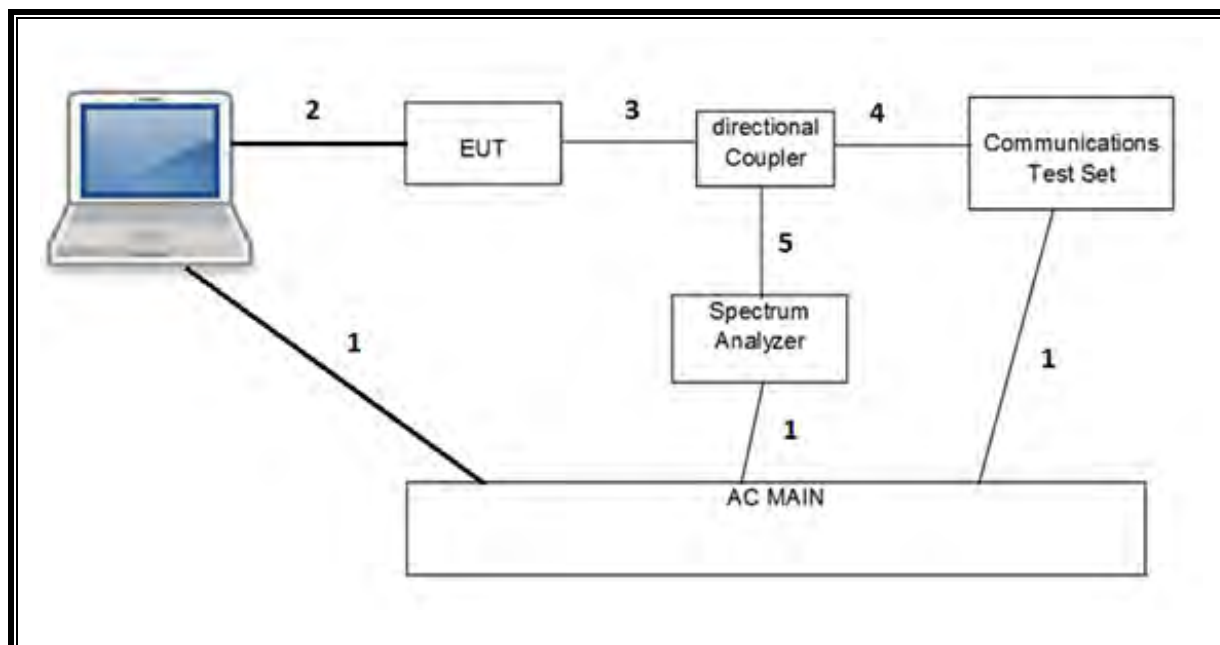
I/O CABLES (RF Conducted Test)

I/O Cable List						
Cable No	Port	# of identical ports	Connector Type	Cable Type	Cable Length (m)	Remarks
1	AC	3	US 115V	Un-shielded	2.0m	N/A
2	USB	1	DC	Un-shielded	1.0m	N/A
3	RF In/Out	1	EUT	Un-shielded	0.6m	N/A
4	RF In/Out	1	Communication Test Set	Un-shielded	1.2m	N/A
5	RF In/Out	1	Barrel	N/A	N/A	N/A

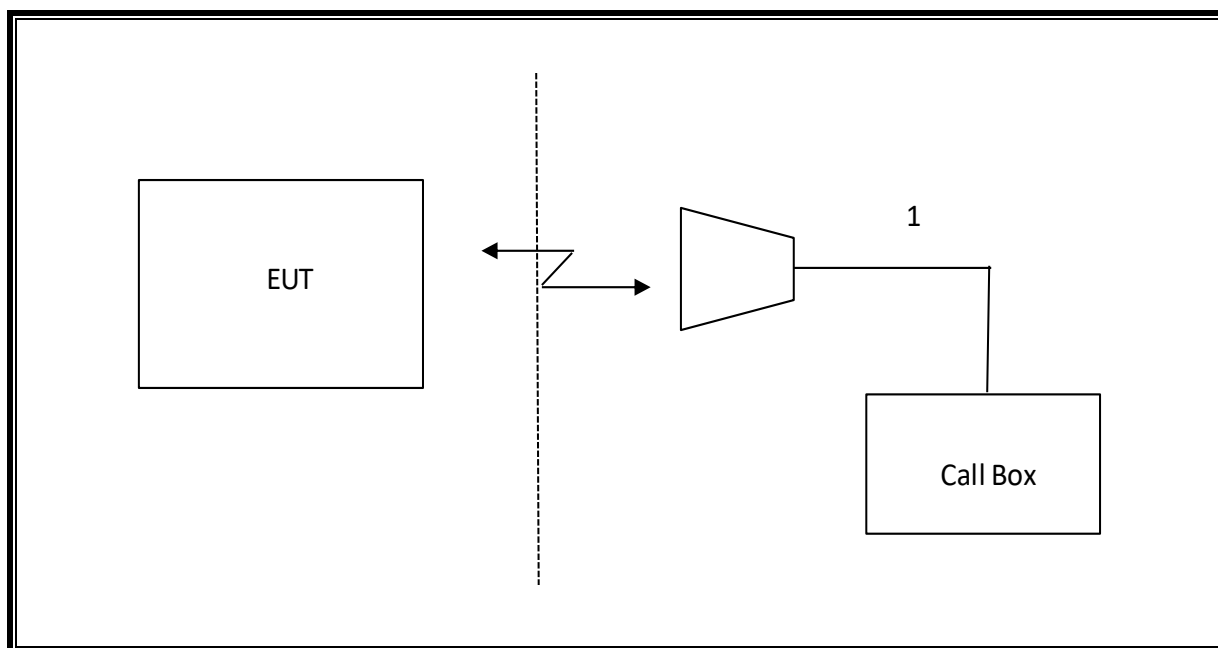
I/O CABLES (RF Radiated Test)

I/O Cable List						
Cable No	Port	# of identical ports	Connector Type	Cable Type	Cable Length (m)	Remarks
1	RF In/Out	1	Antenna	Un-shielded	5.0m	N/A

CONDUCTED SETUP



RADIATED SETUP



6. TEST AND MEASUREMENT EQUIPMENT

The following test and measurement equipment was utilized for the tests documented in this report:

TEST EQUIPMENT LIST				
Description	Manufacturer	Model	Asset	Cal Due
Antenna, Horn 1-18GHz	ETS Lindgren	3117	T344	05/07/2020
Antenna, Horn 18-26GHz	ARA	MWH-1826/B	T447	08/13/2020
Antenna, Horn 26-40GHz	ARA	MWH-2640/B	T446	08/13/2020
*Antenna, Broadband Hybrid, 30MHz to 2000MHz	Sunol Sciences	JB3	PRE0181574	10/14/2020
*Amplifier, 10KHz to 1GHz, 32dB	Sonoma	310N	T15	10/20/2019
Amplifier, 18-26GHz	Agilent	8449B	T404	03/23/2020
Amplifier, 26-40GHz	Miteq	TTA2640	T1804	3/23/2020
*Spectrum Analyzer, PXA 3Hz to 44GHz	Agilent	N9030A	T905	01/24/2020
*Spectrum Analyzer, PXA 3Hz to 44GHz	Keysight	N9030A	T340	01/22/2020
*Spectrum Analyzer, PXA 3Hz to 44GHz	Keysight	N9030A	T1454	01/23/2020
*Spectrum Analyzer, PXA 3Hz to 44GHz	Keysight	N9030A	T339	01/29/2020
Amplifier, 1 to 18GHz	MITEQ	AFS42-00101800-25-S-42	T931	05/11/2020
Spectrum Analyzer, PSA, 3Hz to 44GHz	Keysight	E4446A	T123	01/28/2020
Directional Coupler	KRYTAR	152610	T1536	06/09/2020
Directional Coupler	KRYTAR	152610	T1537	06/08/2020
Wireless Communications Test Set, 8960 Series 10	Agilent	E5515C	T211	05/10/2020
*Filter, HPF 3.0GHz	Micro-Tronics	HPM17543	T487	12/15/2019
Filter, HPF 1.2GHz	Micro-Tronics	WHKX1.2/15G-6ST	T1182	05/30/2020
Wideband Communication Test Set, Call Box	R&S GmbH & Co. KG	CMW500	T959	02/16/2020
Wideband Communication Test Set, Call Box	R&S GmbH & Co. KG	CMW500	T1871	02/18/2020
Wideband Communication Test Set, Call Box	R&S GmbH & Co. KG	CMW500	T376	02/21/2020
Wideband Communication Test Set, Call Box	R&S GmbH & Co. KG	CMW500	T958	02/20/2020
Chamber, Environmental	Cincinnati Sub Zero	ZPHS-8-3.5-SCT/WC	T754	02/05/2020
*Power Meter, P-series single channel	Keysight	N1911A	T1268	01/31/2020
Power Sensor	Keysight	N1921A	T1228	03/01/2020
Antenna, Horn 1-18GHz	ETS Lindgren	T3117	T346	05/14/2020
Antenna, Active Loop 9KHz to 30MHz	EMCO	6502	T35	06/06/2020
UL AUTOMATION SOFTWARE				
CLT Software	UL	UL RF	Ver 2.8.1 Mar 11, 2020	
Power Measurement Software	UL	UL RF	Ver 2.7, 2019	
Radiated test software	UL	UL RF	Ver 9.5 June 15, 2019	

*Testing is completed before equipment expiration date

7. RF OUTPUT POWER VERIFICATION

EUT includes different power levels for head use configuration and body use configuration and the below tables contain the highest of all configurations average conducted output powers as follows:

7.1. GSM

Using CMW500 Communication Test Set

Function: Menu select > GSM Mobile Station > GSM 850/900/1800/1900

Press **Connection control** to choose the different menus

Press **RESET** > choose all to reset all settings

Connection	Press Signal Off to turn off the signal and change settings Network Support > GSM+GPRS or GSM+EGPRS Main Service > Packet Data Service selection > Test Mode A – Auto Slot Config. off
MS Signal	Press Slot Config bottom on the right twice to select and change the number of time slots and power setting > Slot configuration > Uplink/Gamma > 33 dBm for GPRS 850/900 > 27 dBm for EGPRS 850/900 > 30 dBm for GPRS1800/1900 > 26 dBm for EGPRS1800/1900
BS Signal	Enter the same channel number for TCH channel (test channel) and BCCH channel Frequency Offset > + 0 Hz Mode > BCCH and TCH BCCH Level > -85 dBm (May need to adjust if link is not stable) BCCH Channel > choose desire test channel [Enter the same channel number for TCH channel (test channel) and BCCH channel] Channel Type > Off P0> 4 dB Slot Config > Unchanged (if already set under MS Signal) TCH > choose desired test channel Hopping > Off Main Timeslot > 3 (Default)
Network	Coding Scheme > CS 4 (GPRS) and MCS5 (EGPRS) Bit Stream > 2E9-1PSR Bit Pattern
AF/RF	Enter appropriate offsets for Ext. Att. Output and Ext. Att. Input
Connection	Press Signal On to turn on the signal and change settings

RESULT

GSM 850

ID:	38602	Date:	09/27/19
-----	-------	-------	----------

GPRS (GMSK) - Coding Scheme: CS1

Band	Ch No.	Freq. (MHz)	Conducted Average Power (dBm)			
			LAT 1		UAT 1	
			1 slot	2 slots	1 slot	2 slots
850.0	128	824.2	32.75	31.65	30.65	29.65
	190	836.6	32.70	31.75	30.75	29.75
	251	848.8	32.63	31.75	30.71	29.75

EGPRS (8PSK) - Coding Scheme: MCS5

Band	Ch No.	Freq. (MHz)	Conducted Average Power (dBm)			
			LAT 1		UAT 1	
			1 slot	2 slots	1 slot	2 slots
850.0	128	824.2	27.05	25.95	25.15	24.25
	190	836.6	27.25	26.25	25.25	24.24
	251	848.8	27.15	26.05	25.15	24.21

GSM 1900

ID:	38602	Date:	09/27/19
-----	-------	-------	----------

GPRS (GMSK) - Coding Scheme: CS1

Band	Ch No.	Freq. (MHz)	Conducted Average Power (dBm)			
			LAT 1		UAT 1	
			1 slot	2 slots	1 slot	2 slots
1900.0	512	1850.2	31.05	30.23	27.97	24.80
	661	1880.0	31.25	30.25	28.00	25.00
	810	1909.8	31.15	30.23	27.92	24.90

EGPRS (8PSK) - Coding Scheme: MCS5

Band	Ch No.	Freq. (MHz)	Conducted Average Power (dBm)			
			LAT 1		1	
			1 slot	2 slots	1 slot	2 slots
1900.0	512	1850.2	26.15	25.05	23.65	22.65
	661	1880.0	26.25	25.25	23.75	22.75
	810	1909.8	26.15	25.15	23.75	22.75

7.2. CDMA

Maximum output power is verified on the Low, Middle and High channels according to procedures in section 4.4.5.2 of 3GPP2 C.S0011/TIA-98-E for 1xRTT, section 3.1.2.3.4 of 3GPP2 C.S0033-0/TIA-866 for Rel. 0 and section 4.3.4 of 3GPP2 C.S0033-A for Rev. A

1xRTT/ 1xAdvanced

This procedure assumes the Agilent 8960 Test Set has the following applications installed and with valid license.

<u>Application</u>	<u>Rev, License</u>
CDMA2000 Mobile Test	B.15.18, L

- Protocol Rev > 6 (IS-2000-0)
- System ID: 18; NID: 65535, Reg. Ch. #: 610 for Cell, 600 for PCS & 450 for AWS
- Radio Config (RC) > RC1 or RC3
- Service Option (SO) Setup > SO55 or SO32
- Traffic Data Rate > Full
- Rvs Power Ctrl > All Up bits (Maximum TxPout)

1xEV-DO - Release 0 (REL 0)

This procedure assumes the Agilent 8960 Test Set has the following applications installed and with valid license.

EVDO Release 0 - RTAP

- Call Setup > Shift & Preset
- Call Control:
 - Access Network Info > Cell Parameters > Sector ID > 00000000 : 00000000 : 00000000 : 00000000 > Subnet Mask > 0
 - Generator Info > Termination Parameters > Max Forward Packet Duration > 16 Slots
- Call Params:
 - Cell Power > -105.5 dBm/1.23 MHz
 - Channel > (Enter channel number)
 - Application Config > Enhanced Test Application Protocol > RTAP
 - RTAP Rate > 153.6 kbps
 - Rvs Power Ctrl > Active bits
 - Protocol Rel > 0 (1xEV-DO)
- Press "Start Data Connection" when "Session Open" appear in "Active Cell"
- Rvs Power Ctrl > All Up bits (Maximum TxPout)

EVDO Release 0 - FTAP

- Call Setup > Shift & Preset
- Call Control:
 - Access Network Info > Cell Parameters > Sector ID > 00000000 : 00000000 : 00000000 : 00000000 > Subnet Mask > 0
 - Generator Info > Termination Parameters > Max Forward Packet Duration > 16 Slots
- Call Params:
 - Cell Power > -105.5 dBm/1.23 MHz
 - Cell Band > (Select US Cellular or US PCS)
 - Channel > (Enter channel number)
 - Application Config > Enhanced Test Application Protocol > FTAP (default)
 - FTAP Rate > 307.2 kbps (2 Slot, QPSK)
 - Rvs Power Ctrl > Active bits
 - Protocol Rel > 0 (1xEV-DO)
- Press "Start Data Connection" when "Session Open" appear in "Active Cell"
- Rvs Power Ctrl > All Up bits (Maximum TxPout)

1xEV-DO - Revision A (REV A)

This procedure assumes the Agilent 8960 Test Set has the following applications installed and with valid license.

<u>Application</u>	<u>Rev, License</u>
1xEV-DO Terminal Test	A.09.13

EVDO Rev. A – RETAP

- Call Setup > Shift & Preset
- Cell Power > -60 dBm/1.23 MHz
- Protocol Rev > A (1xEV-DO-A)
- Application Config > Enhanced Test Application Protocol > RETAP
- R-Data Pkt Size > 4096
- Protocol Subtype Config > Release A Physical Layer Subtype > Subtype 2
 - PL Subtype 2 Access Channel MAC Subtype > Default (Subtype 0)
- Access Network Info > Cell Parameters
 - Sector ID > 00000000: 00000000: 00000000
 - Subnet Mask > 0
- Generator Info > Termination Parameters > Max Forward Packet Duration > 16 Slots
 - ACK R-Data After > Subpacket 0 (All ACK)
- Rvs Power Ctrl > All Up bits (to get the maximum power)

EVDO Rev. A - FETAP

- Call Setup > Shift & Preset
- Cell Power > -60 dBm/1.23 MHz
- Protocol Rev > A (1xEV-DO-A)
- Application Config > Enhanced Test Application Protocol > FETAP
- F-Traffic Format > 4 (1024, 2, 128) Canonical (307.2k, QPSK)
- Protocol Subtype Config > Release A Physical Layer Subtype > Subtype 2
 - PL Subtype 2 Access Channel MAC Subtype > Default (Subtype 0)
- Access Network Info > Cell Parameters > Sector ID > 00000000: 00000000: 00000000
 - Subnet Mask > 0
- Generator Info > Termination Parameters > Max Forward Packet Duration > 16 Slots
 - ACK R-Data After > Subpacket 0 (All ACK)
- Rvs Power Ctrl > All Up bits (to get the maximum power)

1x Advanced Setup Procedures used to establish the test signals

Call box setup procedure

- Protocol Rev > 6 (IS-2000-0)
- System ID: 331; NID: 65535, Reg. Ch. #.:
- Radio Config (RC) > Fwd11,Rvs8
- Service Option (SO) Setup > SO75 (Loopback)
- Traffic Data Rate > Full
- Rvs Power Ctrl > All Up bits (Maximum TxPout)
- Reverse Power Control Mode: 00-200 to 400 bps
- Smart blanking was disabled.

1xEV-DO Rev. B Setup Procedures used to establish the test signals

Call box setup procedure

- CMW 500 Signal Generator > 1xEV-DO Taskbar Enable
- CMW 500 1xEV-DO Signaling Configuration Window >
- 1xEV-DO Signaling On Window:
 - Under Access Network Control:
 - Band Class: BC0: US Cellular
 - RF Channel: 31
 - 1xEV-DO Power: -70 dBm
 - Release B
- 1xEV-DO Signaling Configuration Window
 - Under RF Frequency Band / Channel: Enter Ch. Frequency

- Under Carrier Configuration: RF Frequency
For Two Carriers: Low Channel (1013)

	<u>RF Channel</u>	<u>RF Channel Offset</u>
Carrier [0]	31	0
Carrier [1]	1013	982

- Under Carrier Configuration: RF Pilot

	<u>Carrier Sector</u>	<u>Active on AN</u>	<u>Assigned to AT</u>
Pilot [0]	C0/S0	✓	✓
	CA/S1	✓	✓

For Three Carriers: Low Channel (1013)

	<u>RF Channel</u>	<u>RF Channel Offset</u>
Carrier [0]	72	0
Carrier [1]	31	-41
Carrier [2]	1013	941

- Under Carrier Configuration: RF Pilot

	<u>Carrier Sector</u>	<u>Active on AN</u>	<u>Assigned to AT</u>
Pilot [0]	C0/S0	✓	✓
Pilot [1]	C1/S1	✓	✓
Pilot [2]	C2/S2	✓	✓

- Rvs Power Ctrl > All Up bits (to get the maximum power)

RESULT

CDMA BC10

ID: 38602 Date: 10/14/2019

Band	Mode	Radio Configuration (RC)	Service Option (SO)	Ch No.	Freq. (MHz)	Conducted Average Power (dBm)	
						LAT 1	UAT 1
BC10 (800MHz)	1xRTT	RC1	2 (Loopback)	450	817.25	25.1	23.4
				560	820.00	25.1	23.3
				670	822.75	25.1	23.3
			55 (Loopback)	450	817.25	25.1	23.4
				560	820.00	25.1	23.3
				670	822.75	25.1	23.3
		RC2	9 (Loopback)	450	817.25	25.1	23.4
				560	820.00	25.1	23.5
				670	822.75	25.2	23.3
			55 (Loopback)	450	817.25	25.1	23.4
				560	820.00	25.1	23.3
				670	822.75	25.1	23.3
		RC3	2 (Loopback)	450	817.25	25.1	23.4
				560	820.00	25.1	23.3
				670	822.75	25.1	23.4
			55 (Loopback)	450	817.25	25.1	23.4
				560	820.00	25.1	23.3
				670	822.75	25.1	23.3
			32 (+ F-SCH)	450	817.25	25.1	23.3
				560	820.00	25.2	23.3
				670	822.75	25.2	23.3
			32 (+ SCH)	450	817.25	25.1	23.4
				560	820.00	25.1	23.3
				670	822.75	25.1	23.4
		RC4	2 (Loopback)	450	817.25	25.1	23.4
				560	820.00	25.1	23.3
				670	822.75	25.1	23.3
			55 (Loopback)	450	817.25	25.1	23.4
				560	820.00	25.1	23.4
				670	822.75	25.1	23.3
			32 (+ F-SCH)	450	817.25	25.2	23.4
				560	820.00	25.2	23.4
				670	822.75	25.2	23.3
			32 (+ SCH)	450	817.25	25.1	23.4
				560	820.00	25.1	23.3
				670	822.75	25.1	23.3
		RC5	9 (Loopback)	450	817.25	25.1	23.4
				560	820.00	25.1	23.3
				670	822.75	25.1	23.3
			55 (Loopback)	450	817.25	25.1	23.4
				560	820.00	25.1	23.3
				670	822.75	25.1	23.3
	1xAdvanced	RC11	2 (Loopback)	450	817.25	25.2	23.3
				560	820.00	25.2	23.3
				670	822.75	25.2	23.3
			75 (Loopback)	450	817.25	25.2	23.4
				560	820.00	25.2	23.4
				670	822.75	25.2	23.3
			32 (+ F-SCH)	450	817.25	25.2	23.4
				560	820.00	25.2	23.4
				670	822.75	24.2	23.4
			32 (+ SCH)	450	817.25	25.2	23.4
				560	820.00	25.0	23.3
				670	822.75	25.1	23.3
	1xEVDO Rel. 0	FTAP Rate: 307.2 kbps(2 slot, QPSK)	RTAP Rate: 153.6 kbps	450	817.25	25.0	23.4
	1xEVDO Rev. A	FETAP: 307.2k, QPSK/ ACK	RETAP: 4096	560	820.00	25.1	23.3
				670	822.75	25.0	23.4
				450	817.25	25.2	23.4
				560	820.00	25.1	23.5
				670	822.75	25.1	23.5

CDMA BC0

ID:	38602	Date:	10/14/2019
------------	-------	--------------	------------

Band	Mode	Radio Configuration (RC)	Service Option (SO)	Ch No.	Freq. (MHz)	Conducted Average Power (dBm)	
						LAT 1	UAT 1
BC0 (850MHz)	1xRTT	RC1	2 (Loopback)	1013	824.70	25.1	23.2
				384	836.52	25.1	23.2
				777	848.31	25.1	23.2
			55 (Loopback)	1013	824.70	25.1	23.2
				384	836.52	25.1	23.3
				777	848.31	25.1	23.2
		RC2	9 (Loopback)	1013	824.70	25.1	23.2
				384	836.52	25.2	23.5
				777	848.31	25.1	23.3
			55 (Loopback)	1013	824.70	25.1	23.2
				384	836.52	25.1	23.2
				777	848.31	25.1	23.1
		RC3	2 (Loopback)	1013	824.70	25.0	23.2
				384	836.52	25.1	23.2
				777	848.31	25.1	23.3
			55 (Loopback)	1013	824.70	25.1	23.2
				384	836.52	25.1	23.2
				777	848.31	25.1	23.3
			32 (+ F-SCH)	1013	824.70	25.1	23.2
				384	836.52	25.1	23.3
				777	848.31	25.2	23.3
			32 (+ SCH)	1013	824.70	25.0	23.2
				384	836.52	25.0	23.3
				777	848.31	25.0	23.3
		RC4	2 (Loopback)	1013	824.70	25.0	23.2
				384	836.52	25.1	23.2
				777	848.31	25.1	23.2
			55 (Loopback)	1013	824.70	25.1	23.2
				384	836.52	25.1	23.2
				777	848.31	25.0	23.2
			32 (+ F-SCH)	1013	824.70	25.1	23.3
				384	836.52	25.1	23.3
				777	848.31	25.1	23.2
			32 (+ SCH)	1013	824.70	24.9	23.2
				384	836.52	25.0	23.3
				777	848.31	25.0	23.4
		RC5	9 (Loopback)	1013	824.70	25.1	23.2
				384	836.52	25.1	23.2
				777	848.31	25.1	23.3
			55 (Loopback)	1013	824.70	25.1	23.2
				384	836.52	25.1	23.2
				777	848.31	25.1	23.3
	1xAdvanced	RC11	2 (Loopback)	1013	824.70	25.1	23.2
				384	836.52	25.2	23.3
				777	848.31	25.2	23.4
			75 (Loopback)	1013	824.70	25.1	23.2
				384	836.52	25.1	23.3
				777	848.31	25.1	23.3
			32 (+ F-SCH)	1013	824.70	25.1	23.4
				384	836.52	25.1	23.4
				777	848.31	25.1	23.4
			32 (+ SCH)	1013	824.70	25.0	23.2
				384	836.52	25.0	23.2
				777	848.31	25.1	23.3
	1xEVDO Rel. 0	FTAP Rate: 307.2 kbps(2 slot, QPSK)	RTAP Rate: 153.6 kbps	1013	824.70	24.9	23.1
	1xEVDO Rev. A	FETAP: 307.2k, QPSK/ ACK	RETAP: 4096	384	836.52	24.9	23.0
				777	848.31	24.8	23.1
				1013	824.70	25.1	23.5
				384	836.52	25.2	23.5
				777	848.31	25.2	23.4

CDMA BC1

ID:	38602	Date:	10/14/2019
------------	-------	--------------	------------

Band	Mode	Radio Configuration (RC)	Service Option (SO)	Ch No.	Freq. (MHz)	Conducted Average Power (dBm)	
						LAT 1	UAT 1
BC1 (1900MHz)	1xRTT	RC1	2 (Loopback)	25	1851.25	24.1	18.9
				600	1880.00	24.1	18.7
				1175	1908.75	24.1	18.7
			55 (Loopback)	25	1851.25	24.1	18.8
				600	1880.00	24.1	18.7
				1175	1908.75	24.1	18.6
		RC2	9 (Loopback)	25	1851.25	24.1	18.8
				600	1880.00	24.1	19.0
				1175	1908.75	24.2	18.7
			55 (Loopback)	25	1851.25	24.1	18.8
				600	1880.00	24.1	18.7
				1175	1908.75	24.1	18.6
		RC3	2 (Loopback)	25	1851.25	24.2	18.9
				600	1880.00	24.2	18.7
				1175	1908.75	24.1	18.7
			55 (Loopback)	25	1851.25	24.2	18.8
				600	1880.00	24.1	18.7
				1175	1908.75	24.1	18.6
			32 (+ F-SCH)	25	1851.25	24.2	18.8
				600	1880.00	24.2	18.8
				1175	1908.75	24.2	18.9
			32 (+ SCH)	25	1851.25	24.1	18.8
				600	1880.00	24.1	18.9
				1175	1908.75	24.1	18.8
		RC4	2 (Loopback)	25	1851.25	24.1	18.8
				600	1880.00	24.1	18.7
				1175	1908.75	24.1	18.6
			55 (Loopback)	25	1851.25	24.2	18.8
				600	1880.00	24.1	18.7
				1175	1908.75	24.1	18.6
			32 (+ F-SCH)	25	1851.25	24.2	18.9
				600	1880.00	24.2	18.9
				1175	1908.75	24.1	18.9
			32 (+ SCH)	25	1851.25	24.1	18.8
				600	1880.00	24.1	18.7
				1175	1908.75	24.1	18.9
		RC5	9 (Loopback)	25	1851.25	24.2	18.9
				600	1880.00	24.1	18.7
				1175	1908.75	24.1	18.7
			55 (Loopback)	25	1851.25	24.2	18.9
				600	1880.00	24.2	18.7
				1175	1908.75	24.1	18.7
	1xAdvanced	RC11	2 (Loopback)	25	1851.25	24.2	19.0
				600	1880.00	24.2	18.9
				1175	1908.75	24.1	19.0
			75 (Loopback)	25	1851.25	24.2	19.0
				600	1880.00	24.2	18.9
				1175	1908.75	24.1	18.9
			32 (+ F-SCH)	25	1851.25	24.2	19.0
				600	1880.00	24.2	18.9
				1175	1908.75	24.1	19.0
			32 (+ SCH)	25	1851.25	24.0	18.9
				600	1880.00	24.1	19.0
				1175	1908.75	24.0	18.8
		1xEVDO Rel. 0	FTAP Rate: 307.2 kbps(2 slot, QPSK)	RTAP Rate: 153.6 kbps	25	1851.25	23.9
					600	1880	23.9
					1175	1908.75	23.8
	1xEVDO Rev. A	FETAP: 307.2k, QPSK/ ACK	RETAP: 4096		25	1851.25	24.1
					600	1880	24.2
					1175	1908.75	24.1

7.3. WCDMA

TEST PROCEDURE

The transmitter output was connected to the input terminal of Directional Coupler via calibrated coaxial cable. The output coupling terminal of the Directional Coupler was directly connected to a spectrum analyzer while the output through terminal connected to the communication test set via calibrated coaxial cable.

The output power was measured with the spectrum analyzer at the low, middle and high channel in each band.

- Set the spectrum analyzer span wide enough or greater than the modulated signal BW.
- Set a spectrum analyzer at peak detection mode with VBW $\geq$ RBW $\geq$ 26dB BW, typically 5MHz.
- Set a marker to point the corresponding peak value.

REL 99

The following tests were completed according to the test requirements outlined in section 5.2 of the 3GPP TS34.121-1 specification. The DUT supports power Class 3, which has a nominal maximum output power of 24 dBm (+1.7/-3.7).

Mode	Subtest	Rel99
WCDMA General Settings	Loopback Mode	Test Mode 2
	Rel99 RMC	12.2kbps RMC
	Power Control Algorithm	Algorithm2
	β_c/β_d	8/15

HSDPA REL 5

The following 4 Sub-tests were completed according to Release 5 procedures in table C.10.1.4 of 3GPP TS 34.121-1 A summary of these settings are illustrated below:

Table C.10.1.4: β values for transmitter characteristics tests with HS-DPCCH

Sub-test	β_c	β_d	β_d (SF)	β_c/β_d	β_{hs} (Note 1, Note 2)	CM (dB) (Note 3)	MPR (dB) (Note 3)
1	2/15	15/15	64	2/15	4/15	0.0	0.0
2	12/15 (Note 4)	15/15 (Note 4)	64	12/15 (Note 4)	24/15	1.0	0.0
3	15/15	8/15	64	15/8	30/15	1.5	0.5
4	15/15	4/15	64	15/4	30/15	1.5	0.5

Note 1: Δ_{ACK} , Δ_{NACK} and $\Delta_{CQI} = 30/15$ with $\beta_{hs} = 30/15 * \beta_c$.

Note 2: For the HS-DPCCH power mask requirement test in clause 5.2C, 5.7A, and the Error Vector Magnitude (EVM) with HS-DPCCH test in clause 5.13.1A, and HSDPA EVM with phase discontinuity in clause 5.13.1AA, Δ_{ACK} and $\Delta_{NACK} = 30/15$ with $\beta_{hs} = 30/15 * \beta_c$, and $\Delta_{CQI} = 24/15$ with $\beta_{hs} = 24/15 * \beta_c$.

Note 3: CM = 1 for $\beta_c/\beta_d = 12/15$, $\beta_{hs}/\beta_c = 24/15$. For all other combinations of DPDCH, DPCCH and HS-DPCCH the MPR is based on the relative CM difference. This is applicable for only UEs that support HSDPA in release 6 and later releases.

Note 4: For subtest 2 the β_c/β_d ratio of 12/15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signalled gain factors for the reference TFC (TF1, TF1) to $\beta_c = 11/15$ and $\beta_d = 15/15$.

HSUPA REL 6

The following 5 Sub-tests were completed according to Release 6 procedures in table C.11.1.3 of 3GPP TS 34.121-1. A summary of these settings are illustrated below:

Table C.11.1.3: β values for transmitter characteristics tests with HS-DPCCH and E-DCH

Sub-test	β_c	β_d	β_d (SF)	β_c/β_d	β_{HS} (Note 1)	β_{ec}	β_{ed} (Note 4) (Note 5)	β_{ed} (SF)	β_{ed} (Codes)	CM (dB) (Note 2)	MPR (dB) (Note 2) (Note 6)	AG Index (Note 5)	E-TFCI
1	11/15 (Note 3)	15/15 (Note 3)	64	11/15 (Note 3)	22/15	209/25	1309/225	4	1	1.0	0.0	20	75
2	6/15	15/15	64	6/15	12/15	12/15	94/75	4	1	3.0	2.0	12	67
3	15/15	9/15	64	15/9	30/15	30/15	β_{ed1} : 47/15 β_{ed2} : 47/15	4	2	2.0	1.0	15	92
4	2/15	15/15	64	2/15	4/15	2/15	56/75	4	1	3.0	2.0	17	71
5	15/15	0	-	-	5/15	5/15	47/15	4	1	1.0	0.0	12	67

Note 1: For sub-test 1 to 4, Δ_{ACK} , Δ_{NACK} and $\Delta_{CQI} = 30/15$ with $\beta_{hs} = 30/15 * \beta_c$. For sub-test 5, Δ_{ACK} , Δ_{NACK} and $\Delta_{CQI} = 5/15$ with $\beta_{hs} = 5/15 * \beta_c$.

Note 2: CM = 1 for $\beta_c/\beta_d = 12/15$, $\beta_{hs}/\beta_c = 24/15$. For all other combinations of DPDCH, DPCCH, HS-DPCCH, E-DPDCH and E-DPCCH the MPR is based on the relative CM difference.

Note 3: For subtest 1 the β_c/β_d ratio of 11/15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signalled gain factors for the reference TFC (TF1, TF1) to $\beta_c = 10/15$ and $\beta_d = 15/15$.

Note 4: In case of testing by UE using E-DPDCH Physical Layer category 1, Sub-test 3 is omitted according to TS25.306 Table 5.1g.

Note 5: β_{ed} can not be set directly; it is set by Absolute Grant Value.

Note 6: For subtests 2, 3 and 4, UE may perform E-DPDCH power scaling at max power which could results in slightly smaller MPR values.

DUAL CARRIER HSDPA (DC-HSDPA (REL 8, CAT 24))

The following 4 Sub-tests for DC-HSDPA were completed according to Release 8 procedures in table C08.1.12 of 3GPP TS 34.121-1. A summary of subtest settings are illustrated below:

Table C.8.1.12: Fixed Reference Channel H-Set 12

Parameter	Unit	Value
Nominal Avg. Inf. Bit Rate	kbps	60
Inter-TTI Distance	TTI's	1
Number of HARQ Processes	Processes	6
Information Bit Payload (N_{INF})	Bits	120
Number Code Blocks	Blocks	1
Binary Channel Bits Per TTI	Bits	960
Total Available SML's in UE	SML's	19200
Number of SML's per HARQ Proc.	SML's	3200
Coding Rate		0.15
Number of Physical Channel Codes	Codes	1
Modulation		QPSK

Note 1: The RMC is intended to be used for DC-HSDPA mode and both cells shall transmit with identical parameters as listed in the table.

Note 2: Maximum number of transmission is limited to 1, i.e., retransmission is not allowed. The redundancy and constellation version 0 shall be used.

RESULT

WCDMA BAND 5

ID:	39004	Date:	10/14/19
------------	-------	--------------	----------

Band	Mode		UL Ch No.	Freq. (MHz)	MPR (dB)	Conducted Average Power (dBm)	
						LAT 1	UAT 1
W-CDMA Band 5 (850MHz)	Rel 99	RMC, 12.2 kbps	4132	826.4	N/A	25.0	23.4
			4183	836.6	N/A	25.2	23.5
			4233	846.6	N/A	25.0	23.3
	HSDPA	Subtest 1	4132	826.4	0	25.0	23.4
			4183	836.6	0	25.1	23.3
			4233	846.6	0	25.1	23.4
		Subtest 2	4132	826.4	0	25.1	23.2
			4183	836.6	0	25.2	23.5
			4233	846.6	0	25.1	23.3
		Subtest 3	4132	826.4	0.5	24.7	23.1
			4183	836.6	0.5	24.9	23.0
			4233	846.6	0.5	24.8	23.2
		Subtest 4	4132	826.4	0.5	24.7	23.1
			4183	836.6	0.5	24.8	23.0
			4233	846.6	0.5	24.8	23.0
	HSUPA	Subtest 1	4132	826.4	0	25.0	23.2
			4183	836.6	0	25.1	23.3
			4233	846.6	0	25.1	23.4
		Subtest 2	4132	826.4	2	23.2	21.3
			4183	836.6	2	23.1	21.3
			4233	846.6	2	23.2	21.4
		Subtest 3	4132	826.4	1	24.2	22.1
			4183	836.6	1	24.3	22.1
			4233	846.6	1	24.2	22.2
		Subtest 4	4132	826.4	2	23.2	21.6
			4183	836.6	2	23.2	21.6
			4233	846.6	2	23.2	21.6
		Subtest 5	4132	826.4	0	25.1	23.0
			4183	836.6	0	25.1	23.0
			4233	846.6	0	25.1	23.2
	DC-HSDPA	Subtest 1	4132	826.4	0	25.0	23.4
			4183	836.6	0	24.8	23.3
			4233	846.6	0	24.8	23.3
		Subtest 2	4132	826.4	0	25.1	23.4
			4183	836.6	0	24.8	23.4
			4233	846.6	0	24.8	23.4
		Subtest 3	4132	826.4	0.5	24.5	23.0
			4183	836.6	0.5	24.6	22.9
			4233	846.6	0.5	24.5	23.1
		Subtest 4	4132	826.4	0.5	24.5	23.0
			4183	836.6	0.5	24.4	23.0
			4233	846.6	0.5	24.4	23.1

WCDMA BAND 2

ID:	39004	Date:	10/14/19
------------	-------	--------------	----------

Band	Mode		UL Ch No.	Freq. (MHz)	MPR (dB)	Conducted Average Power (dBm)	
						LAT 1	UAT 1
W-CDMA Band 2 (1900MHz)	Rel 99	RMC, 12.2 kbps	9262	1852.4	N/A	24.1	18.9
			9400	1880.0	N/A	24.2	18.7
			9538	1907.6	N/A	24.0	19.0
	HSDPA	Subtest 1	9262	1852.4	0	24.0	18.9
			9400	1880.0	0	24.1	18.8
			9538	1907.6	0	24.0	18.8
		Subtest 2	9262	1852.4	0	24.1	18.9
			9400	1880.0	0	24.2	19.0
			9538	1907.6	0	24.0	18.9
		Subtest 3	9262	1852.4	0.5	23.6	18.4
			9400	1880.0	0.5	23.7	18.3
			9538	1907.6	0.5	23.7	18.5
		Subtest 4	9262	1852.4	0.5	23.6	18.2
			9400	1880.0	0.5	23.7	18.1
			9538	1907.6	0.5	23.5	18.2
	HSUPA	Subtest 1	9262	1852.4	0	24.0	18.6
			9400	1880.0	0	24.1	18.5
			9538	1907.6	0	24.0	18.7
		Subtest 2	9262	1852.4	2	22.2	16.7
			9400	1880.0	2	22.2	16.5
			9538	1907.6	2	22.1	16.7
		Subtest 3	9262	1852.4	1	23.0	17.4
			9400	1880.0	1	23.1	17.2
			9538	1907.6	1	23.1	17.4
		Subtest 4	9262	1852.4	2	22.1	16.9
			9400	1880.0	2	22.2	16.8
			9538	1907.6	2	22.0	16.9
		Subtest 5	9262	1852.4	0	24.1	18.3
			9400	1880.0	0	24.1	18.2
			9538	1907.6	0	24.0	18.4
	DC-HSDPA	Subtest 1	9262	1852.4	0	24.0	18.9
			9400	1880.0	0	24.1	18.8
			9538	1907.6	0	24.0	19.0
		Subtest 2	9262	1852.4	0	24.1	18.9
			9400	1880.0	0	23.9	18.7
			9538	1907.6	0	24.0	18.9
		Subtest 3	9262	1852.4	0.5	24.1	18.6
			9400	1880.0	0.5	24.1	18.5
			9538	1907.6	0.5	24.0	18.7
		Subtest 4	9262	1852.4	0.5	24.1	18.7
			9400	1880.0	0.5	24.2	18.5
			9538	1907.6	0.5	24.0	18.7

WCDMA BAND 4

ID:	39004	Date:	10/14/19
------------	-------	--------------	----------

Band	Mode		UL Ch No.	Freq. (MHz)	MPR (dB)	Conducted Average Power (dBm)	
						LAT 1	UAT 1
W-CDMA Band 4 (1700MHz)	Rel 99	RMC, 12.2 kbps	1312	1712.4	N/A	24.5	18.2
			1413	1732.6	N/A	24.2	18.5
			1513	1752.6	N/A	24.3	18.3
	HSDPA	Subtest 1	1312	1712.4	0	24.4	18.2
			1413	1732.6	0	24.3	18.2
			1513	1752.6	0	24.3	17.9
		Subtest 2	1312	1712.4	0	24.3	18.2
			1413	1732.6	0	24.5	18.5
			1513	1752.6	0	24.4	18.3
		Subtest 3	1312	1712.4	0.5	24.4	18.1
			1413	1732.6	0.5	24.4	17.9
			1513	1752.6	0.5	24.4	17.6
		Subtest 4	1312	1712.4	0.5	24.3	17.8
			1413	1732.6	0.5	24.3	17.7
			1513	1752.6	0.5	24.3	17.4
	HSUPA	Subtest 1	1312	1712.4	0	24.4	18.2
			1413	1732.6	0	24.3	18.0
			1513	1752.6	0	24.3	17.8
		Subtest 2	1312	1712.4	2	24.3	16.1
			1413	1732.6	2	24.3	16.2
			1513	1752.6	2	24.4	15.9
		Subtest 3	1312	1712.4	1	24.3	7.1
			1413	1732.6	1	24.3	16.9
			1513	1752.6	1	24.3	16.7
		Subtest 4	1312	1712.4	2	24.3	16.4
			1413	1732.6	2	24.4	16.4
			1513	1752.6	2	24.4	16.2
		Subtest 5	1312	1712.4	0	24.4	17.9
			1413	1732.6	0	24.3	17.8
			1513	1752.6	0	24.4	17.5
	DC-HSDPA	Subtest 1	1312	1712.4	0	24.4	18.2
			1413	1732.6	0	24.3	18.2
			1513	1752.6	0	24.3	18.0
		Subtest 2	1312	1712.4	0	24.4	18.3
			1413	1732.6	0	24.3	18.2
			1513	1752.6	0	24.4	17.9
		Subtest 3	1312	1712.4	0.5	24.4	18.3
			1413	1732.6	0.5	24.3	18.1
			1513	1752.6	0.5	24.3	17.7
		Subtest 4	1312	1712.4	0.5	24.3	18.4
			1413	1732.6	0.5	24.3	18.1
			1513	1752.6	0.5	24.4	17.8

8. CONDUCTED TEST RESULTS

8.1. OCCUPIED BANDWIDTH

RULE PART(S)

FCC: §2.1049

IC: RSS132; RSS133§2.3; RSS139

LIMITS

For reporting purposes only.

TEST PROCEDURE

The transmitter output was connected to a calibrated coaxial cable and coupler, the other end of which was connected to a spectrum analyzer. The occupied bandwidth was measured with the spectrum analyzer at the middle channel in each band. The 99% and -26dB bandwidths was also measured and recorded.

RESULTS

There is no limit required and power is the same for low, middle and high channel; therefore, only middle channel was tested.

GSM

Band	Modulation	Channel	f(MHz)	99% BW (KHz)	-26dB BW (KHz)
850MHz	GPRS	190	836.6	247.61	320.2
	EGPRS			247.33	322.0
1900MHz	GPRS	661	1880.0	247.37	316.6
	EGPRS			250.69	319.7

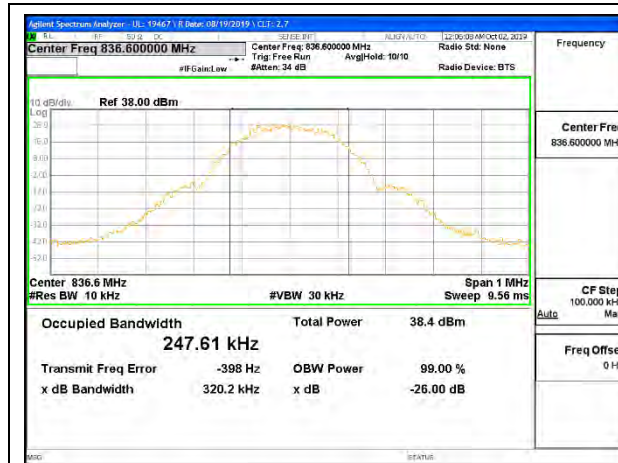
CDMA

Band	Modulation	Channel	f(MHz)	99% BW (MHz)	-26dB BW (MHz)
BC10	1xRTT	560	820.0	1.2717	1.425
	1xEV-DO Rev A			1.2652	1.419
BC0	1xRTT	384	836.5	1.2740	1.419
	1xEV-DO Rev A			1.2669	1.419
BC1	1xRTT	600	1880.0	1.2723	1.428
	1xEV-DO Rev A			1.2630	1.428

WCDMA

Band	Modulation	Channel	f(MHz)	99% BW (MHz)	-26dB BW (MHz)
BAND 5	REL 99	4408	836.6	4.0675	4.598
	HSDPA			4.0690	4.602
BAND 2	REL 99	9800	1880.0	4.0651	4.601
	HSDPA			4.0679	4.605
BAND 4	REL 99	1638	1732.6	4.0681	4.610
	HSDPA			4.0637	4.604

8.1.1. GSM



GSM 850MHz GPRS Middle Channel



GSM 850MHz EGPRS Middle Channel



GSM 1900MHz GPRS Middle Channel



GSM 1900MHz EGPRS Middle Channel

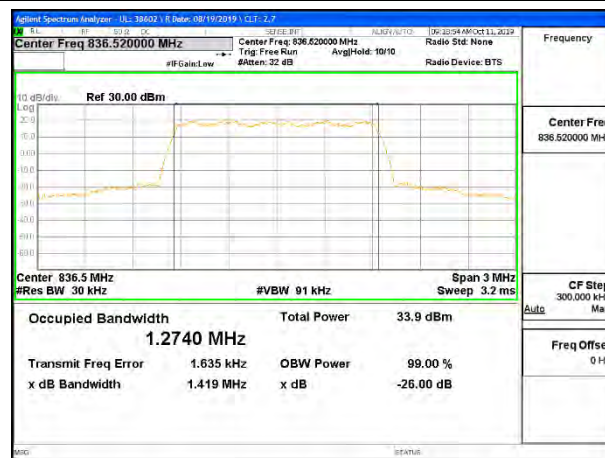
8.1.2. CDMA



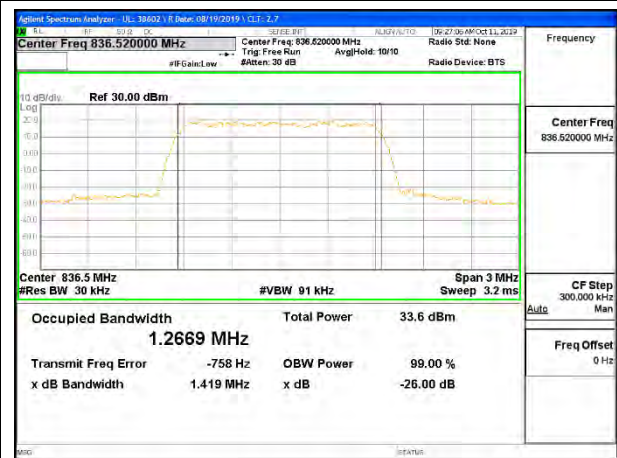
CDMA BC10 1xRTT Middle Channel



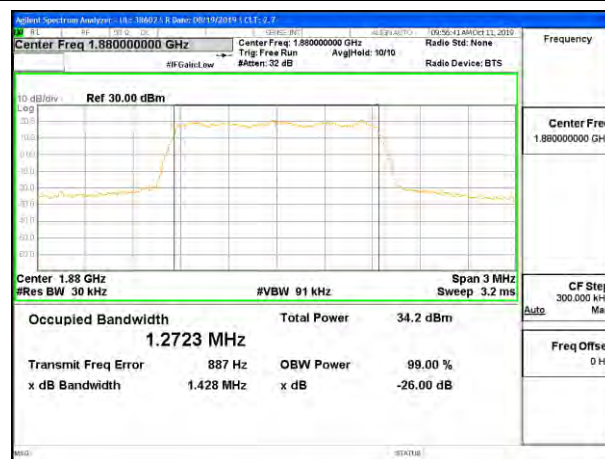
CDMA BC10 1xEV-DO Rev A Middle Channel



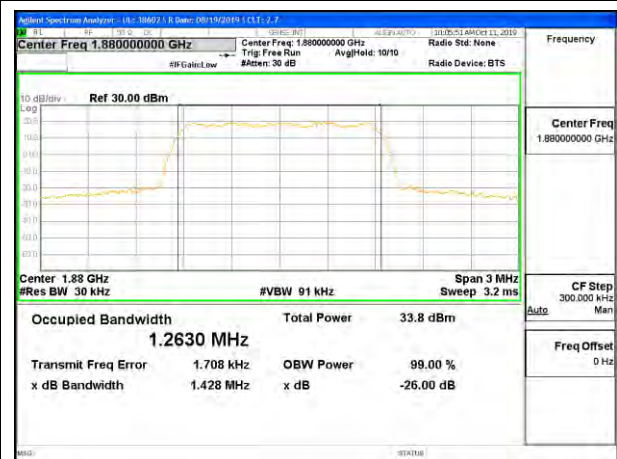
CDMA BC0 1xRTT Middle Channel



CDMA BC0 1xEV-DO Rev A Middle Channel



CDMA BC1 1xRTT Middle Channel



CDMA BC1 1xEV-DO Rev A Middle Channel

8.1.3. WCDMA



WCDMA Band 5 Rel 99 Middle Channel



WCDMA Band 5 HSDPA Middle Channel



WCDMA Band 2 Rel 99 Middle Channel



WCDMA Band 2 HSDPA Middle Channel



WCDMA Band 4 Rel 99 Middle Channel



WCDMA Band 4 HSDPA Middle Channel

8.2. BAND EDGE AND EMISSION MASK

RULE PART(S)

FCC: §2.1051, §22.917, §24.238, §27.53 and §90.691
IC: RSS132§5.5; RSS133§6.5 and RSS139§6.6

LIMITS

FCC: §22.917, §24.238, §27.53 (h)

The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log (P)$ dB.

FCC: §90.691 Emission mask requirements for EA-based systems.

(a) Out-of-band emission requirement shall apply only to the “outer” channels included in an EA license and to spectrum adjacent to interior channels used by incumbent licensees. The emission limits are as follows:

(1) For any frequency removed from the EA licensee's frequency block by up to and including 37.5 kHz, the power of any emission shall be attenuated below the transmitter power (P) in watts by at least $116 \log_{10}(f/6.1)$ decibels or $50 + 10 \log_{10}(P)$ decibels or 80 decibels, whichever is the lesser attenuation, where f is the frequency removed from the center of the outer channel in the block in kilohertz and where f is greater than 12.5 kHz.

(2) For any frequency removed from the EA licensee's frequency block greater than 37.5 kHz, the power of any emission shall be attenuated below the transmitter power (P) in watts by at least $43 + 10 \log_{10}(P)$ decibels or 80 decibels, whichever is the lesser attenuation, where f is the frequency removed from the center of the outer channel in the block in kilohertz and where f is greater than 37.5 kHz.

RSS132§5.5

Mobile and base station equipment shall comply with the limits in (i) and (ii) below.

- (i) In the first 1.0 MHz band immediately outside and adjacent to each of the sub-bands specified in Section 5.1, the power of emissions per any 1% of the occupied bandwidth shall be attenuated (in dB) below the transmitter output power P (dBW) by at least $43 + 10 \log_{10} p$ (watts).
- (ii) After the first 1.0 MHz immediately outside and adjacent to each of the sub-bands, the power of emissions in any 100 kHz bandwidth shall be attenuated (in dB) below the transmitter output power P (dBW) by at least $43 + 10 \log_{10} p$ (watts). If the measurement is performed using 1% of the occupied bandwidth, power integration over 100 kHz is required.

RSS133§6.5

Equipment shall comply with the limits in (i) and (ii) below.

- (i) In the 1.0 MHz bands immediately outside and adjacent to the equipment's operating frequency block, the emission power per any 1% of the emission bandwidth shall be attenuated (in dB) below the transmitter output power P (dBW) by at least $43 + 10 \log_{10} p$ (watts).
- (ii) After the first 1.0 MHz, the emission power in any 1 MHz bandwidth shall be attenuated (in dB) below the transmitter output power P (dBW) by at least $43 + 10 \log_{10} p$ (watts). If the measurement is performed using 1% of the emission bandwidth, power integration over 1.0 MHz is required.

RSS139§6.6

- (i) In the first 1.0 MHz bands immediately outside and adjacent to the equipment's smallest operating frequency block, Footnote 2 which can contain the equipment's occupied bandwidth, the emission power per any 1% of the emission bandwidth shall be attenuated below the transmitter output power P (in dBW) by at least $43 + 10 \log_{10} p$ (watts) dB.
- (ii) After the first 1.0 MHz outside the equipment's smallest operating frequency block, which can contain the equipment's occupied bandwidth, the emission power in any 1 MHz bandwidth shall be attenuated below the transmitter output power P (in dBW) by at least $43 + 10 \log_{10} p$ (watts) dB.

TEST PROCEDURE

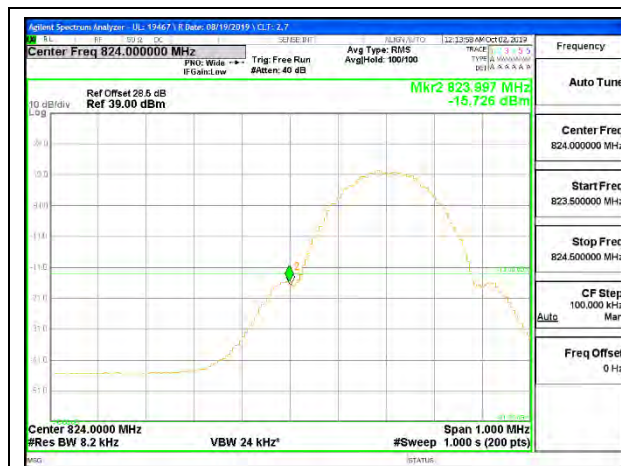
The transmitter output was connected to a R&S CMW500 Test Set and configured to operate at maximum power. The band edge emissions were measured at the required operating frequencies in each band on the Spectrum Analyzer. For each band edge measurement:

- Set the spectrum analyzer span to include the block edge frequency.
- Set a marker to point the corresponding band edge frequency in each test case.
- Set display line at -13 dBm
- Set resolution bandwidth to at least 1% of emission bandwidth.

RESULTS

8.2.1. GSM

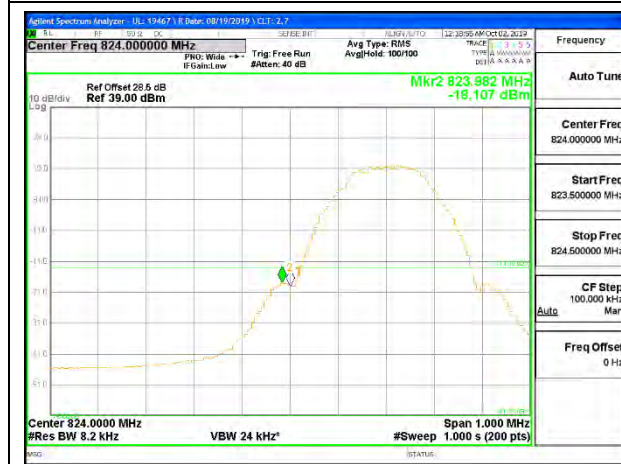
GSM 850



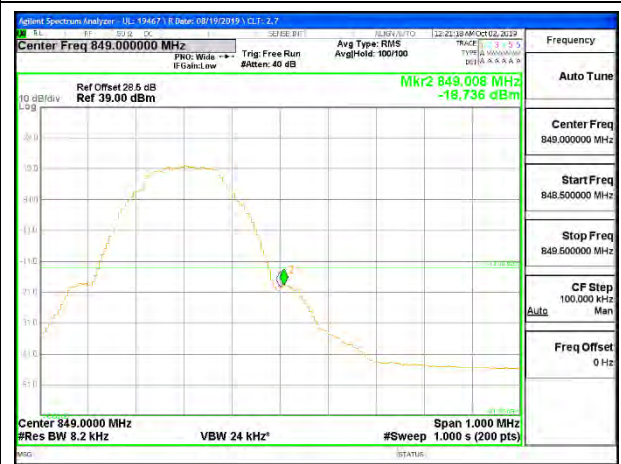
GSM 850 GPRS Low Channel



GSM 850 GPRS High Channel



GSM 850 EGPRS Low Channel



GSM 850 EGPRS High Channel

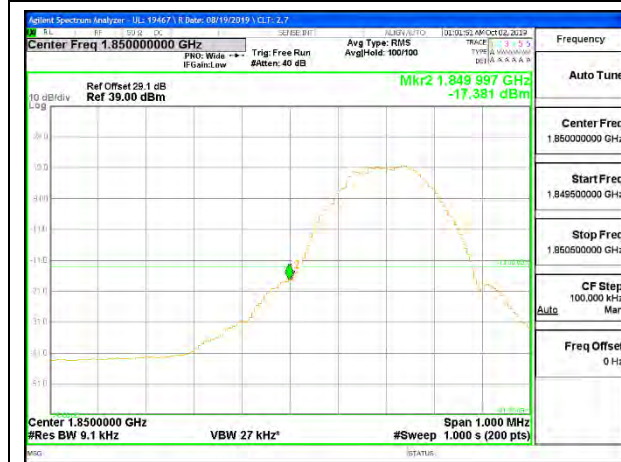
GSM 1900



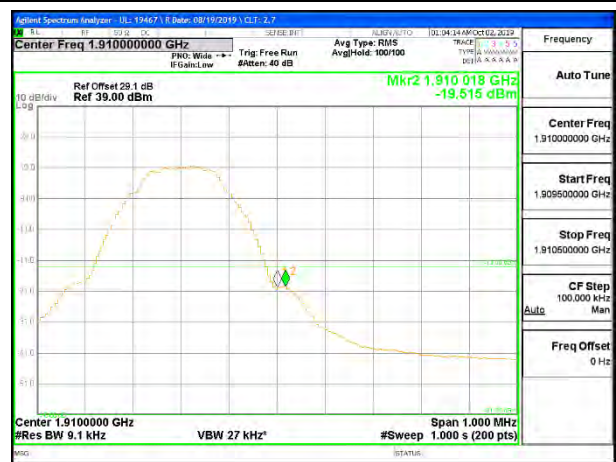
GSM 1900 GPRS Low Channel



GSM 1900 GPRS High Channel



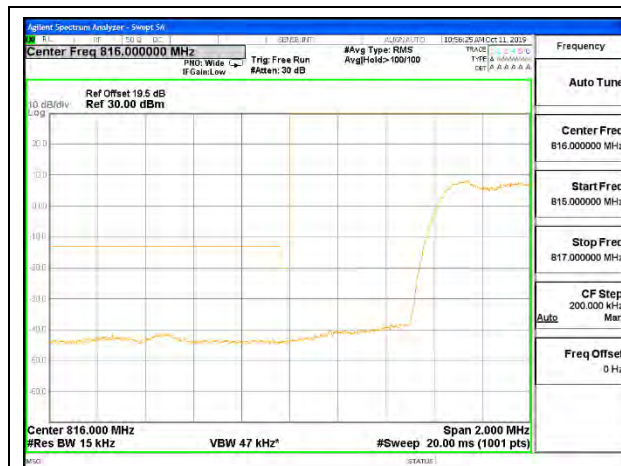
GSM 1900 EGPRS Low Channel



GSM 1900 EGPRS High Channel

8.2.2. CDMA

CDMA BC10



CDMA BC10 1xRTT Low Channel, RBW=1% of EBW



CDMA BC10 1xRTT High Channel, RBW=1% of EBW

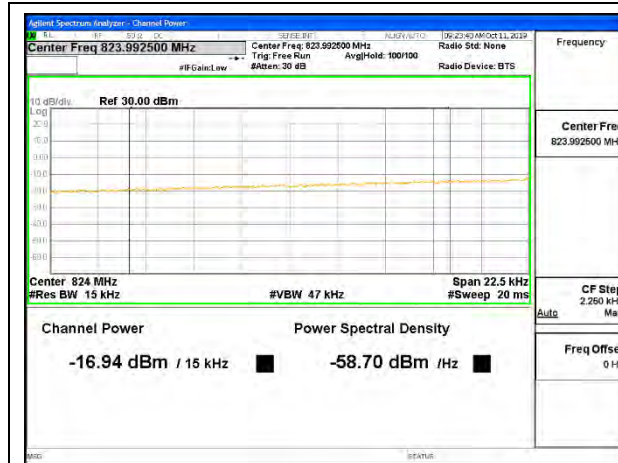


CDMA BC10 1xEV-DO Rev A Low Channel, RBW=1% of EBW

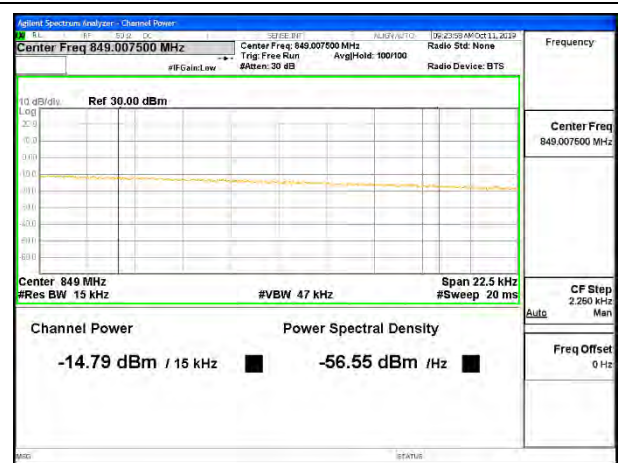


CDMA BC10 1xEV-DO Rev A High Channel, RBW=1% of EBW

CDMA BC0



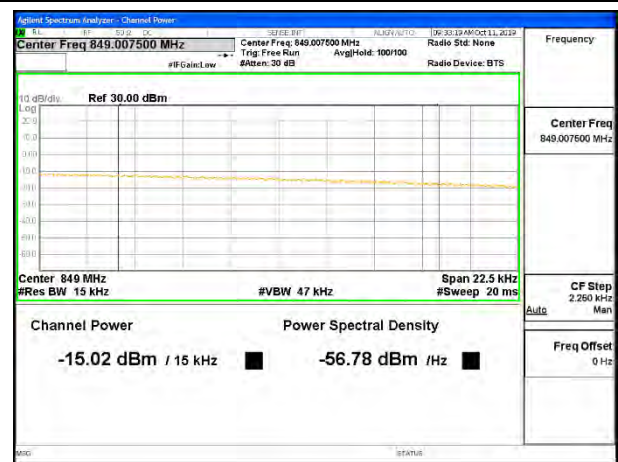
CDMA BC0 1xRTT Low Channel



CDMA BC0 1xRTT High Channel



CDMA BC0 1xEV-DO Rev A Low Channel

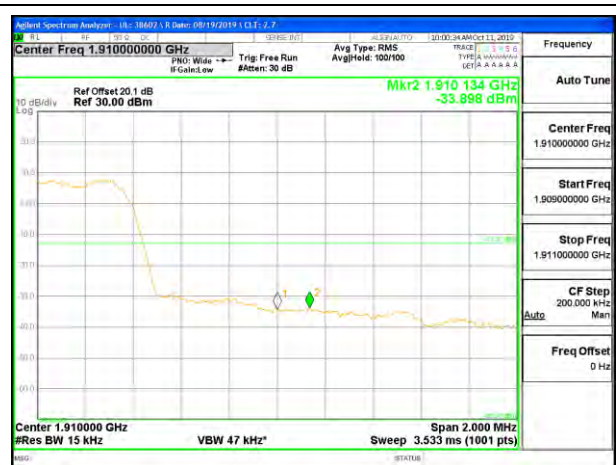


CDMA BC0 1xEV-DO Rev A High Channel

CDMA BC1



CDMA BC1 1xRTT Low Channel



CDMA BC1 1xRTT High Channel

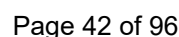


CDMA BC1 1xEV-DO Rev A Low Channel



CDMA BC1 1xEV-DO Rev A High Channel

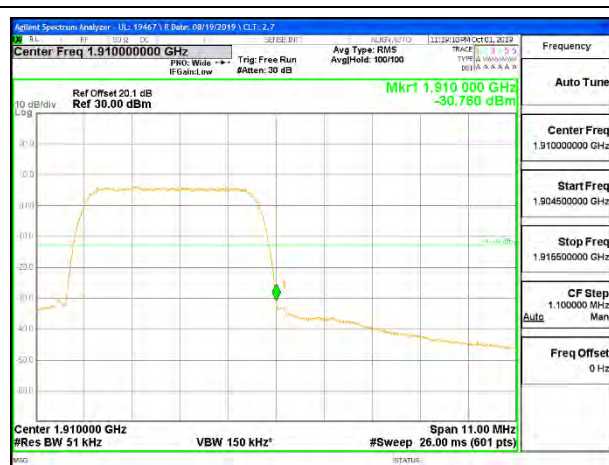
WCDMA BAND 5



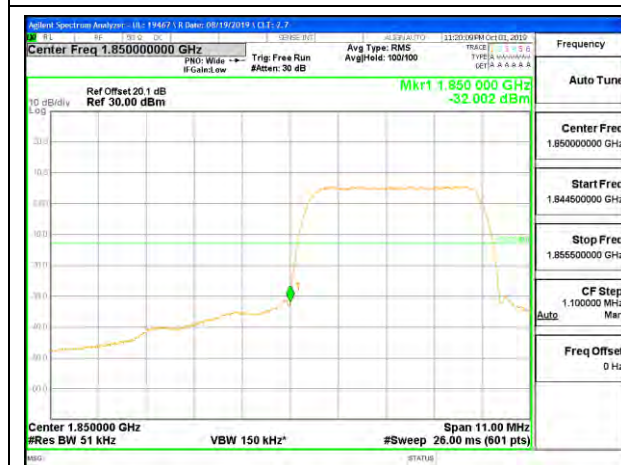
WCDMA BAND 2



WCDMA Band 2 Rel 99 Low Channel



WCDMA Band 2 Rel 99 High Channel



WCDMA Band 2 HSDPA Low Channel



WCDMA Band 2 HSDPA High Channel

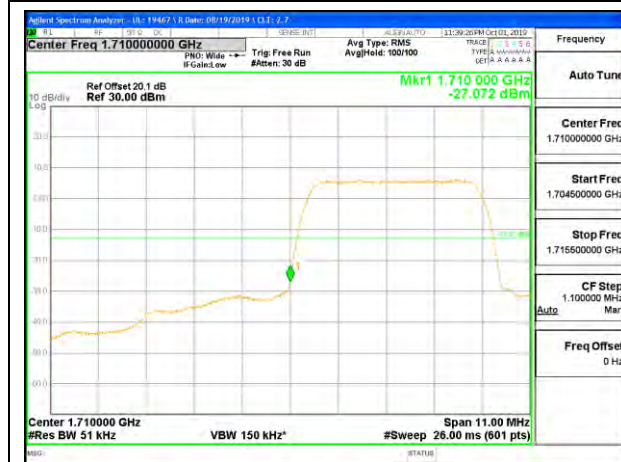
WCDMA BAND 4



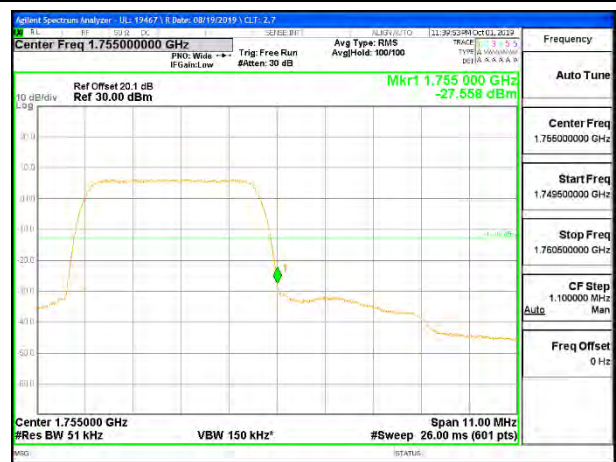
WCDMA Band 4 Rel 99 Low Channel



WCDMA Band 4 Rel 99 High Channel



WCDMA Band 4 HSDPA Low Channel



WCDMA Band 4 HSDPA High Channel

8.3. OUT OF BAND EMISSIONS

RULE PART(S)

FCC: §2.1051, §22.917, §24.238, §27.53 and §90.691
IC: RSS132§5.5; RSS133§6.5 and RSS139§6.6

LIMITS

FCC: §22.917, §24.238, §27.53 (h), §90.691

The minimum permissible attenuation level of any spurious emissions is $43 + 10 \log (P)$ dB where transmitting power (P) in Watts.

RSS132§5.5, RSS133§6.5, RSS139§6.6

The minimum permissible attenuation level of any spurious emissions is $43 + 10 \log (P)$ dB where transmitting power (P) in Watts.

TEST PROCEDURE

The RF output of the transmitter was connected to a spectrum analyzer through a calibrated coaxial cable. Sufficient scans were taken to show the out-of-band Emissions, if any, up to 10th harmonic. Multiple sweeps were recorded in maximum hold mode using a peak detector to ensure that the worst-case emissions were caught.

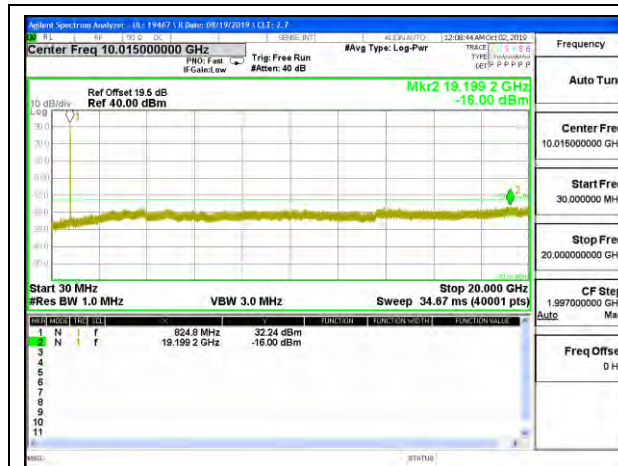
For each out of band emissions measurement:

- Set display line at -13 dBm
- Set RBW & VBW to 100 kHz for the measurement below 1 GHz, and 1 MHz for the measurement above 1 GHz.
(NOTE: Worst case set RBW/VBW to 1MHz/3MHz)

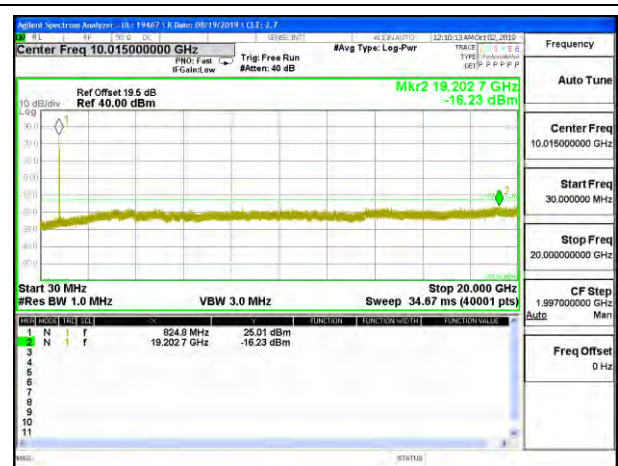
RESULTS

8.3.1. GSM

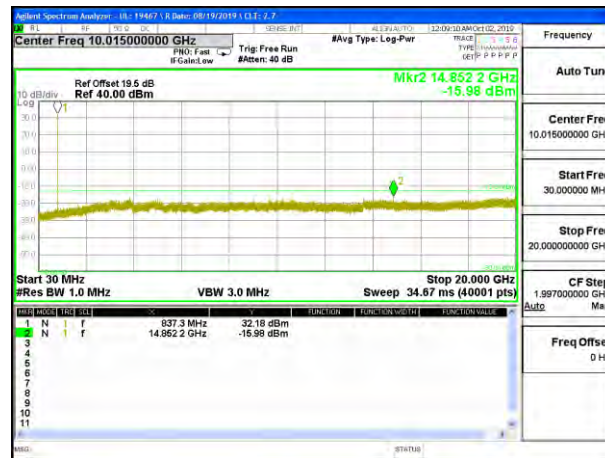
GSM 850MHz



GSM 850MHz GPRS Low Channel



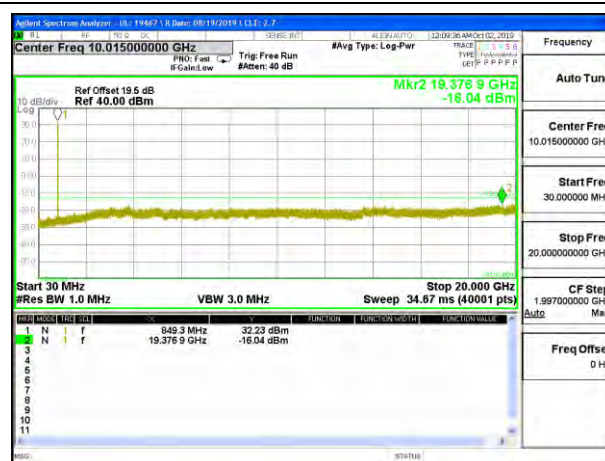
GSM 850MHz EGPRS Low Channel



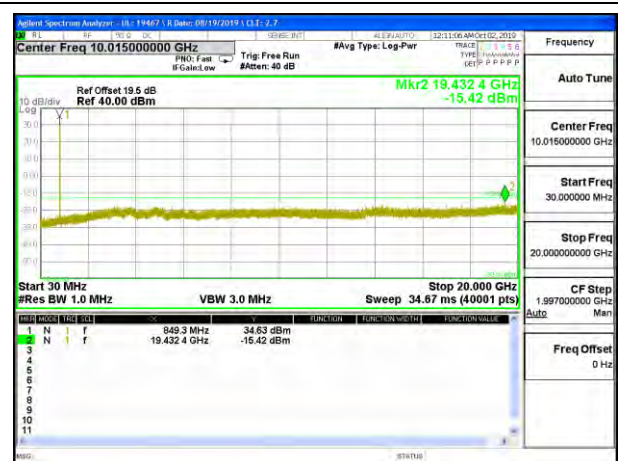
GSM 850MHz GPRS Middle Channel



GSM 850MHz EGPRS Middle Channel

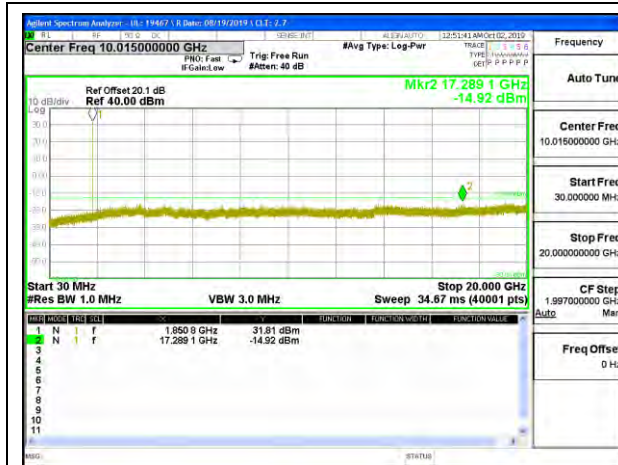


GSM 850MHz GPRS High Channel

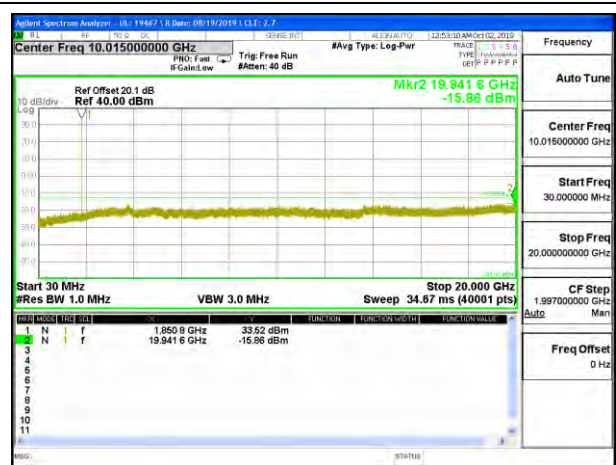


GSM 850MHz EGPRS High Channel

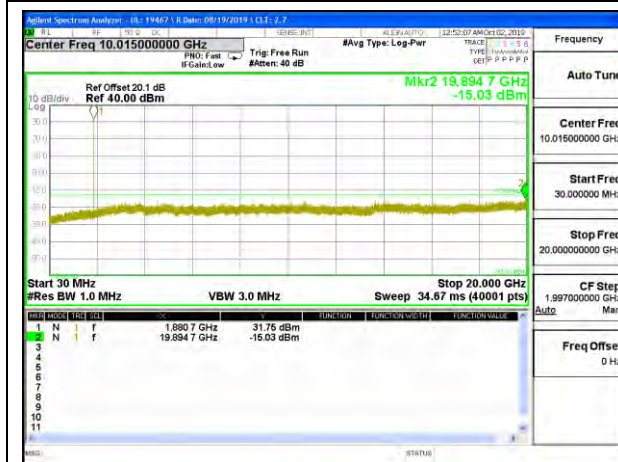
GSM 1900MHz



GSM 1900MHz GPRS Low Channel



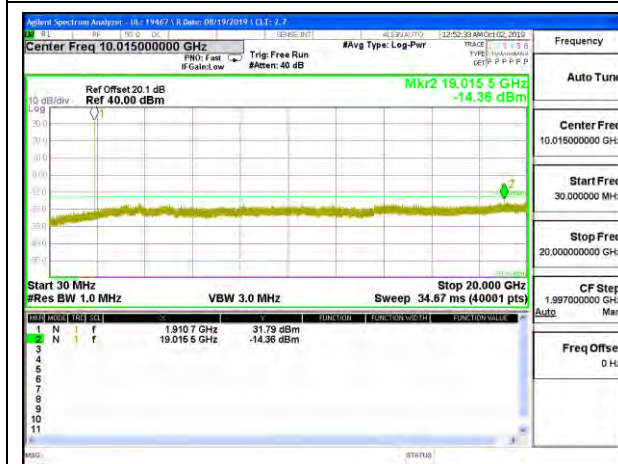
GSM 1900MHz EGPRS Low Channel



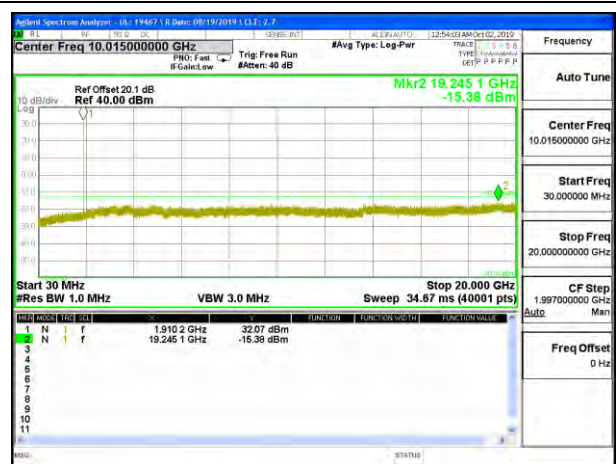
GSM 1900MHz GPRS Middle Channel



GSM 1900MHz EGPRS Middle Channel



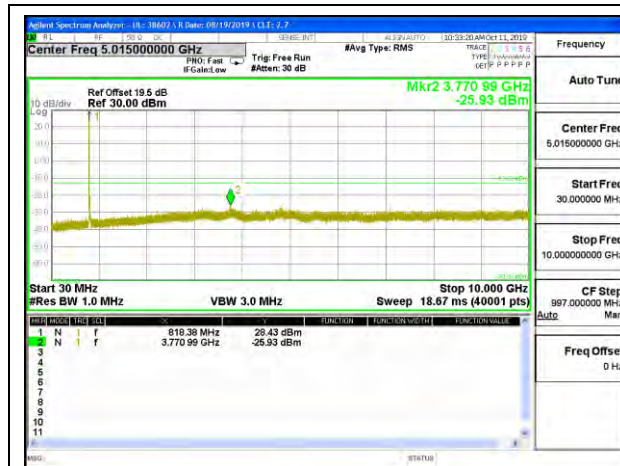
GSM 1900MHz GPRS High Channel



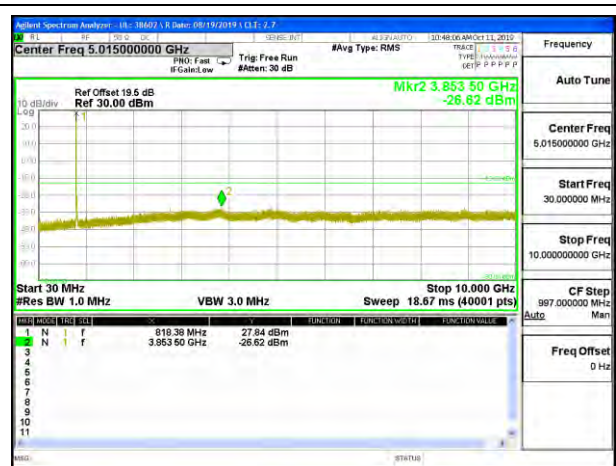
GSM 1900MHz EGPRS High Channel

8.3.2. CDMA

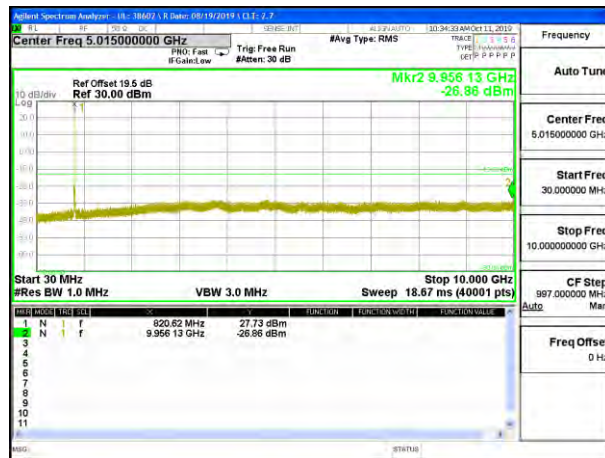
CDMA BC10



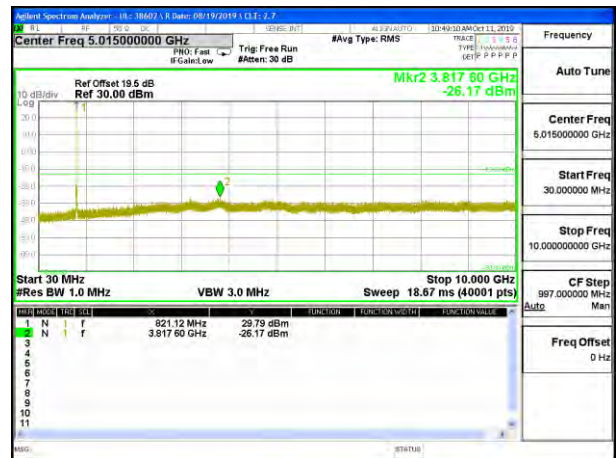
CDMA BC10 1xRTT Low Channel



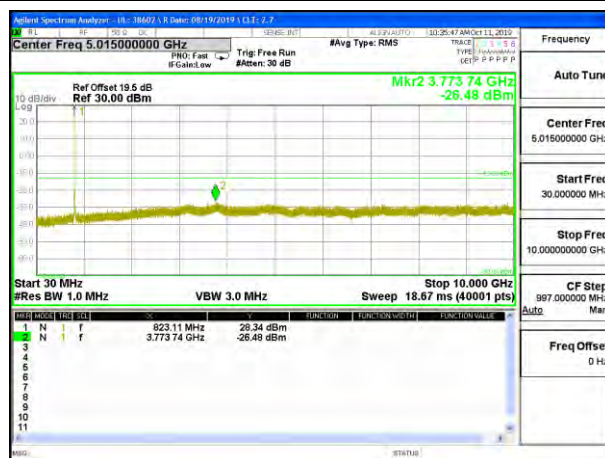
CDMA BC10 1xEV-DO Rev A Low Channel



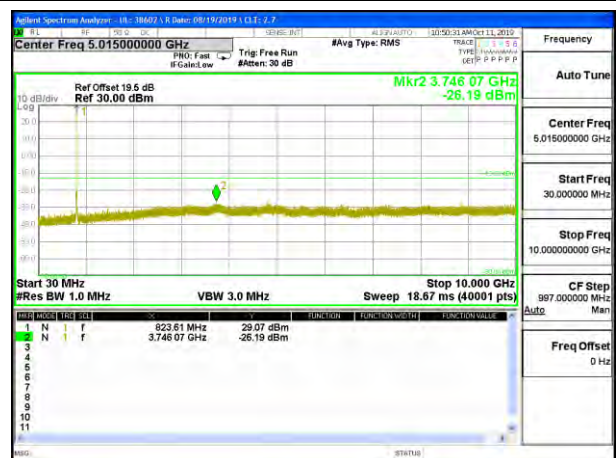
CDMA BC10 1xRTT Middle Channel



CDMA BC10 1xEV-DO Rev A Middle Channel

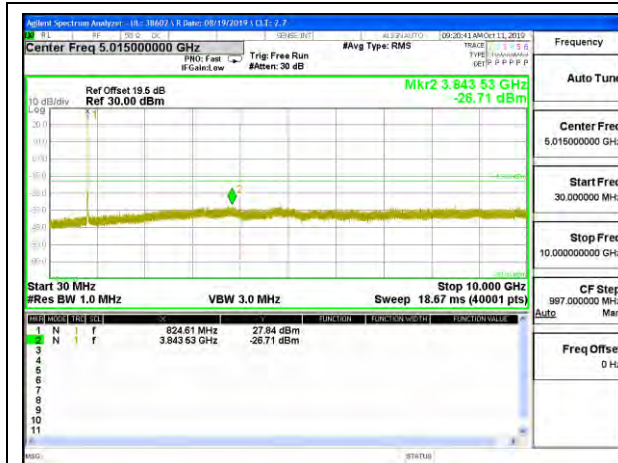


CDMA BC10 1xRTT High Channel

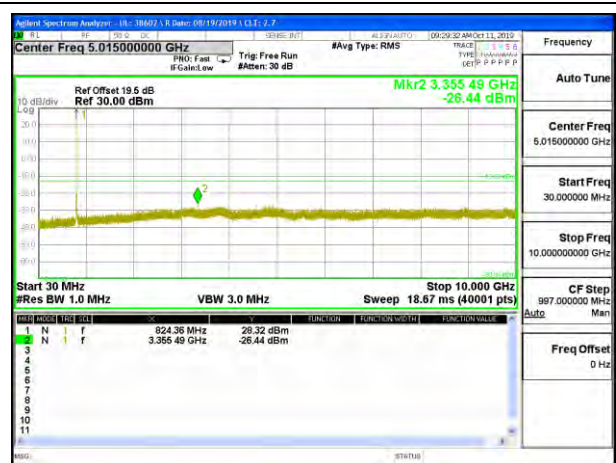


CDMA BC10 1xEV-DO Rev A High Channel

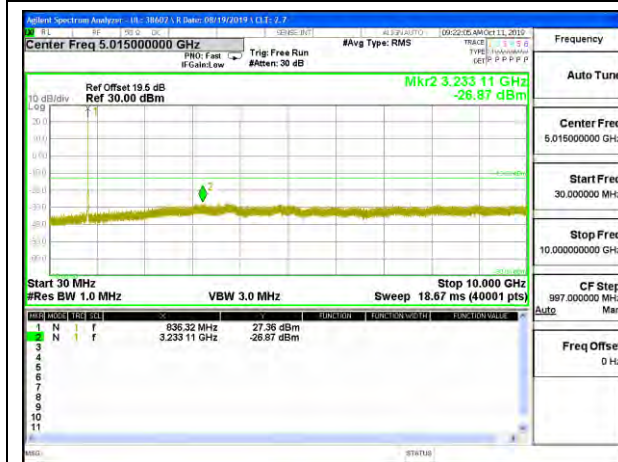
CDMA BC0



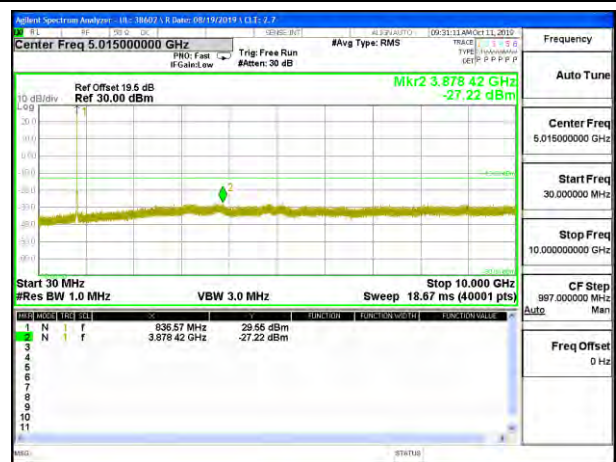
CDMA BC0 1xRTT Low Channel



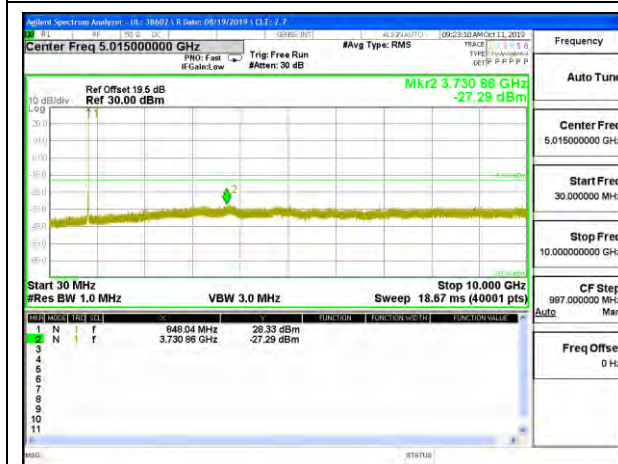
CDMA BC0 1xEV-DO Rev A Low Channel



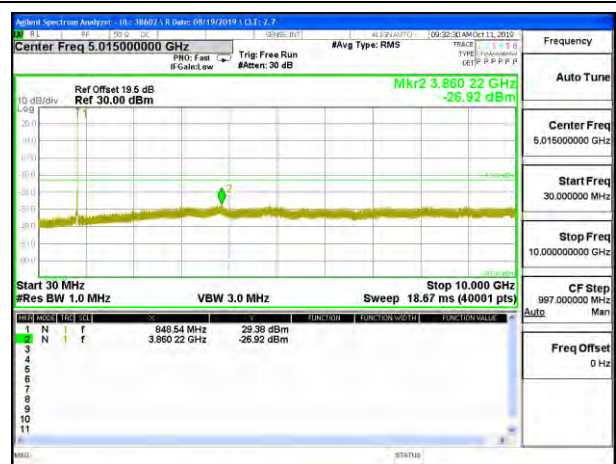
CDMA BC0 1xRTT Middle Channel



CDMA BC0 1xEV-DO Rev A Middle Channel

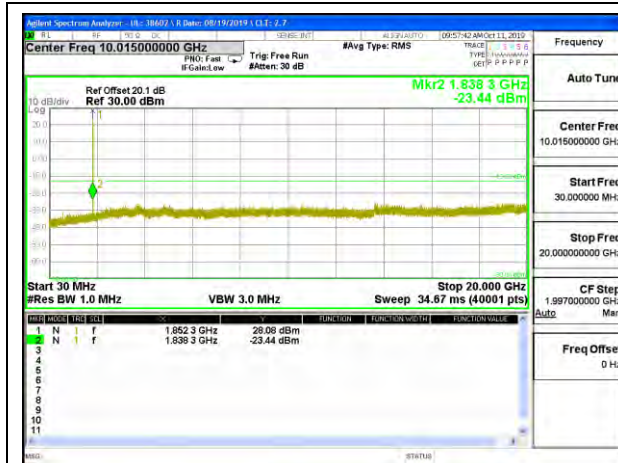


CDMA BC0 1xRTT High Channel

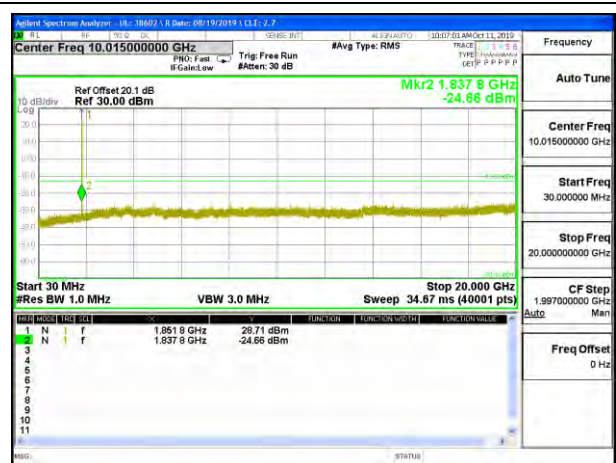


CDMA BC0 1xEV-DO Rev A High Channel

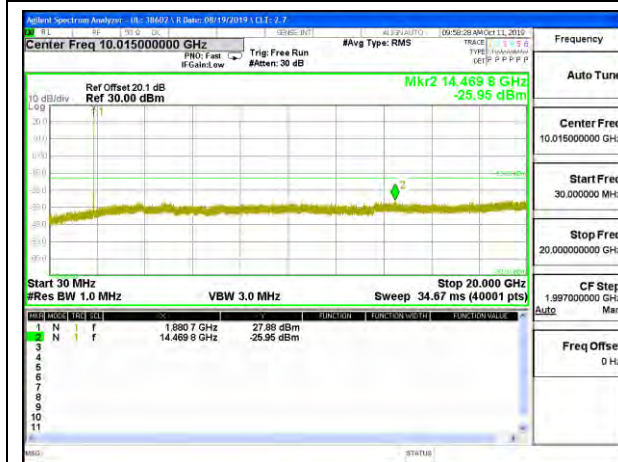
CDMA BC1



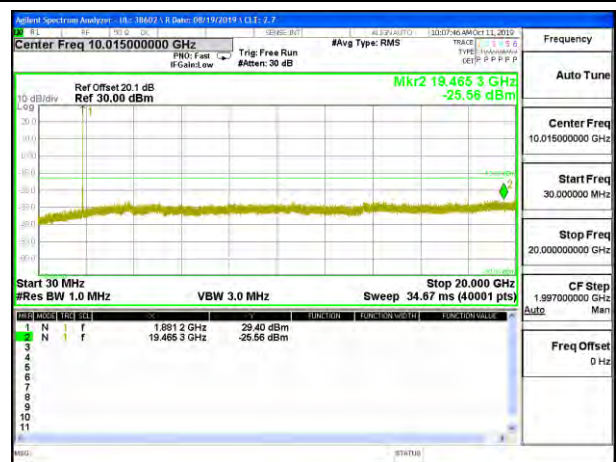
CDMA BC1 1xRTT Low Channel



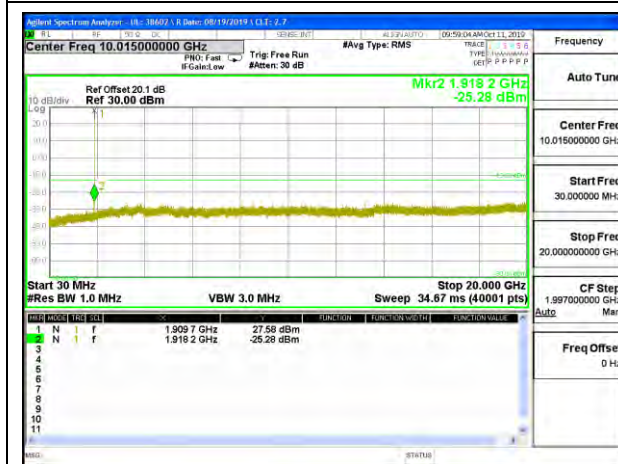
CDMA BC1 1xEV-DO Rev A Low Channel



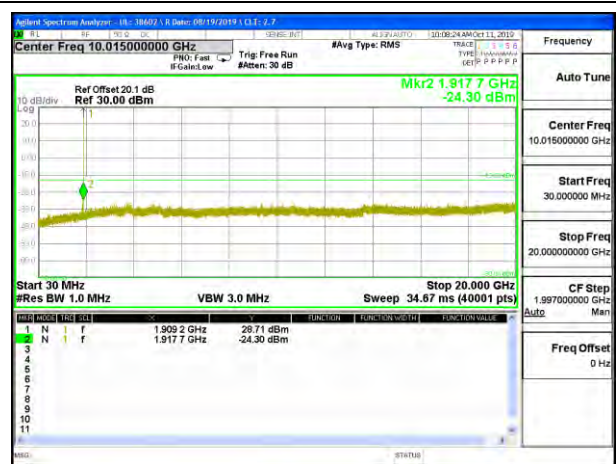
CDMA BC1 1xRTT Middle Channel



CDMA BC1 1xEV-DO Rev A Middle Channel



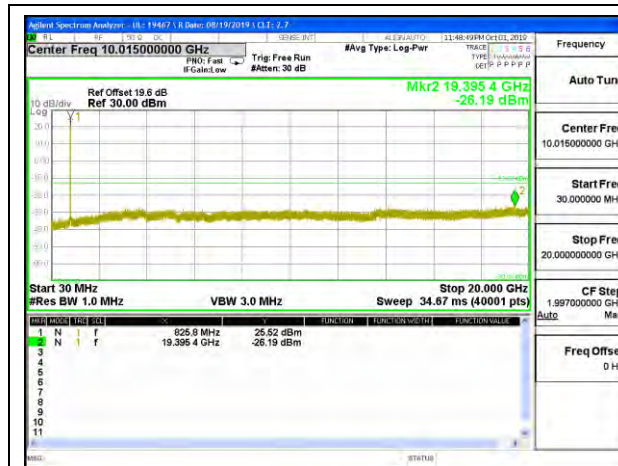
CDMA BC1 1xRTT High Channel



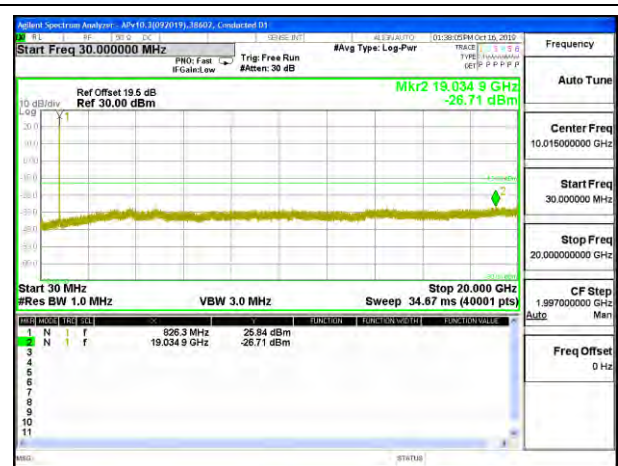
CDMA BC1 1xEV-DO Rev A High Channel

8.3.3. WCDMA

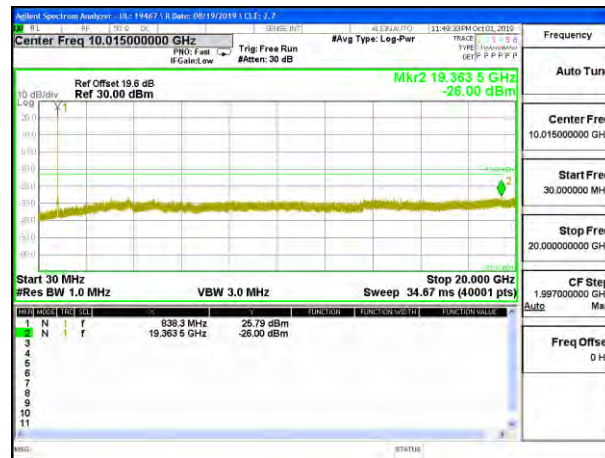
WCDMA BAND 5



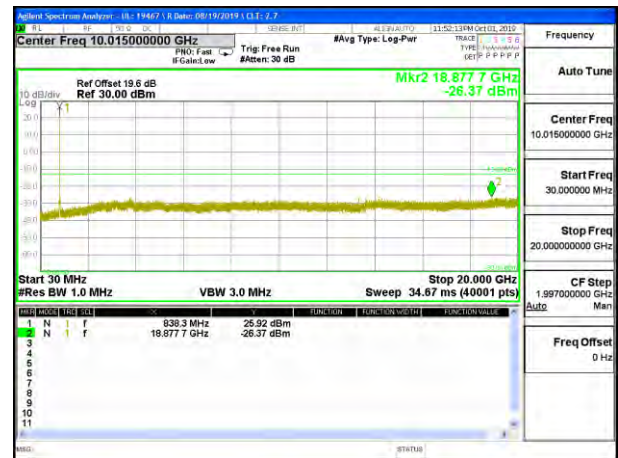
WCDMA Band 5 Rel 99 Low Channel



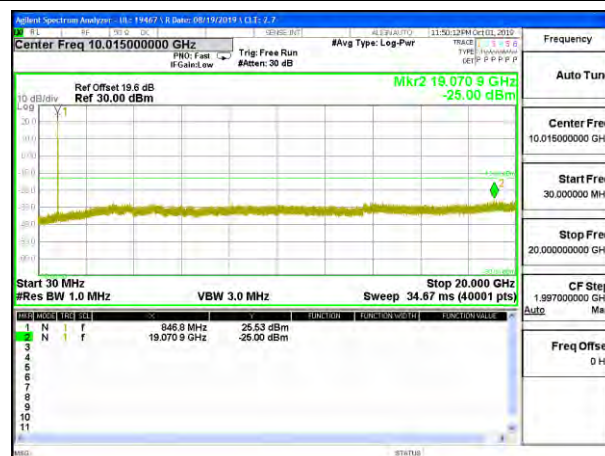
WCDMA Band 5 HSDPA Low Channel



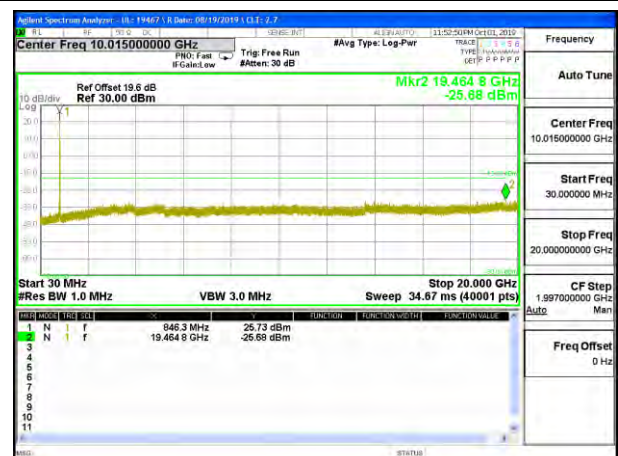
WCDMA Band 5 Rel 99 Middle Channel



WCDMA Band 5 HSDPA Middle Channel

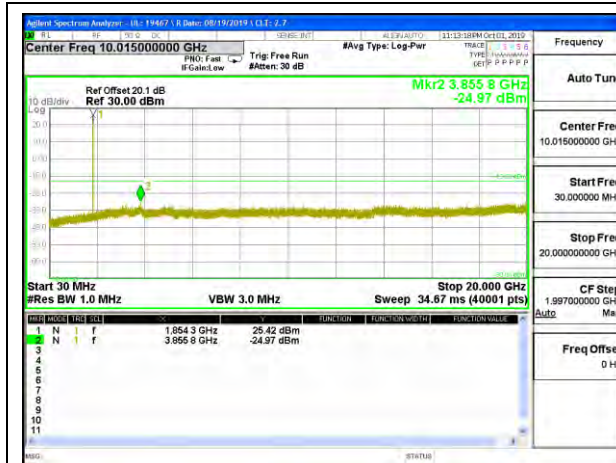


WCDMA Band 5 Rel 99 High Channel

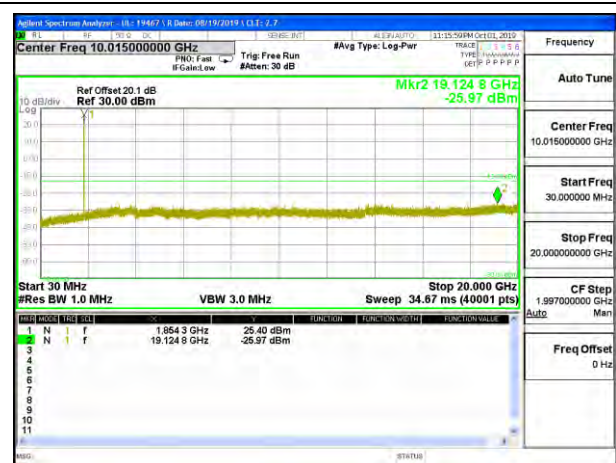


WCDMA Band 5 HSDPA High Channel

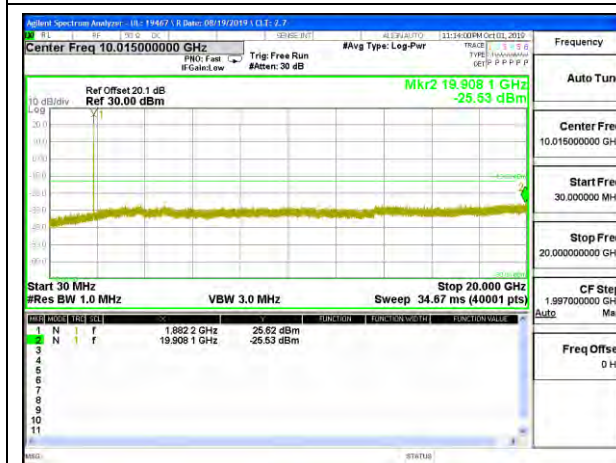
WCDMA BAND 2



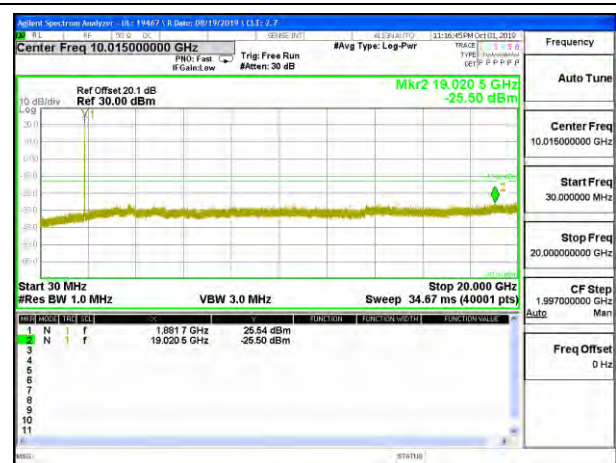
WCDMA Band 2 Rel 99 Low Channel



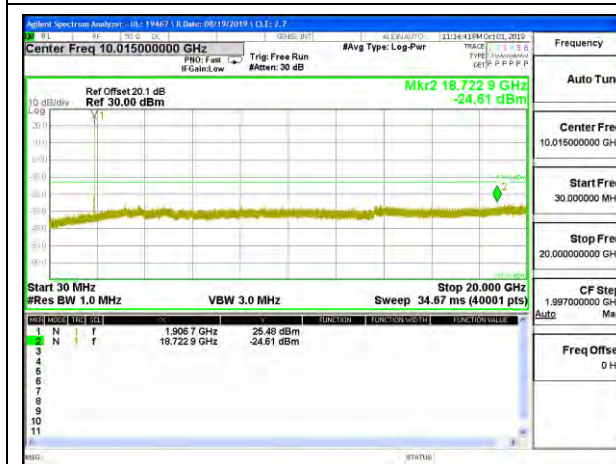
WCDMA Band 2 HSDPA Low Channel



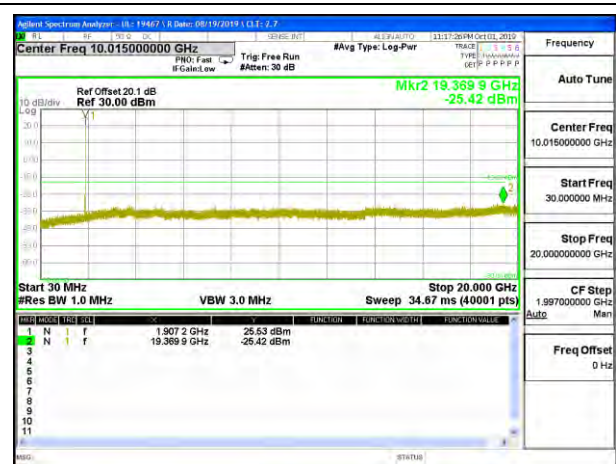
WCDMA Band 2 Rel 99 Middle Channel



WCDMA Band 2 HSDPA Middle Channel

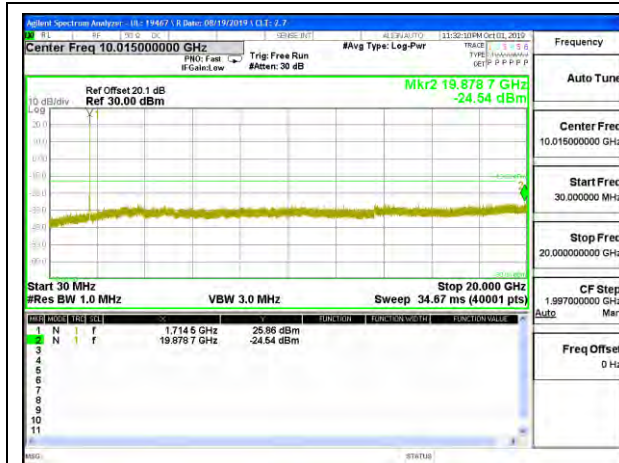


WCDMA Band 2 Rel 99 High Channel

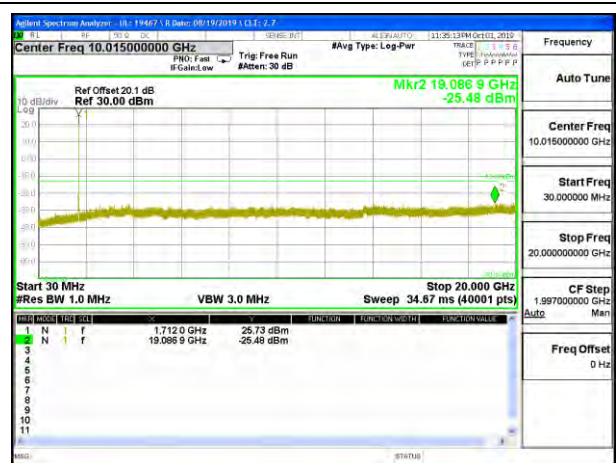


WCDMA Band 2 HSDPA High Channel

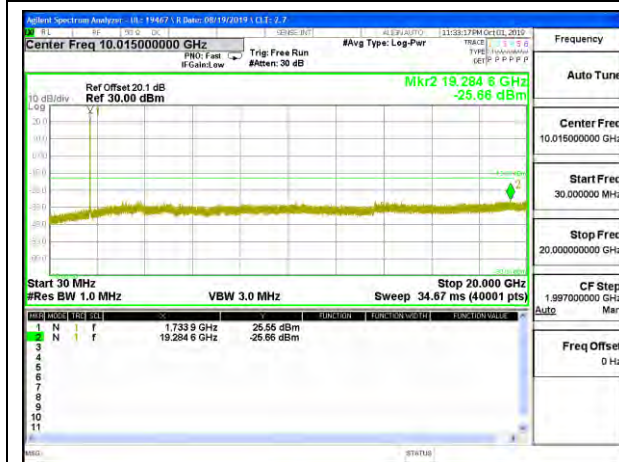
WCDMA BAND 4



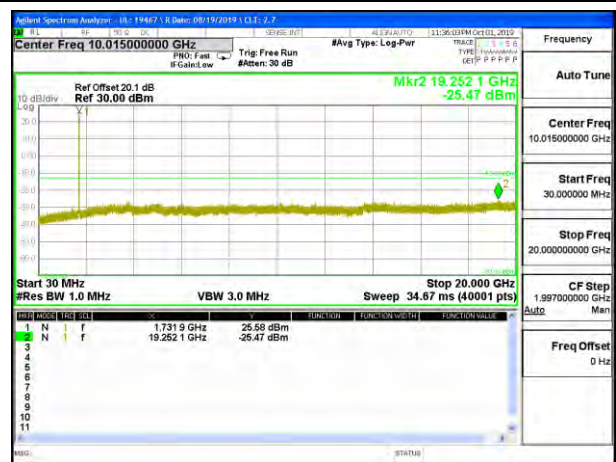
WCDMA Band 4 Rel 99 Low Channel



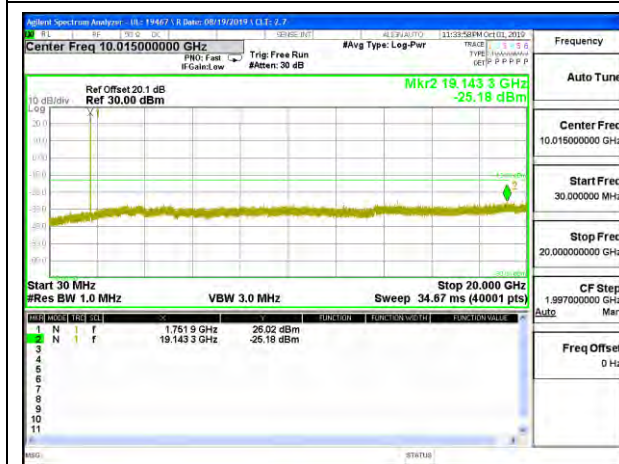
WCDMA Band 4 HSDPA Low Channel



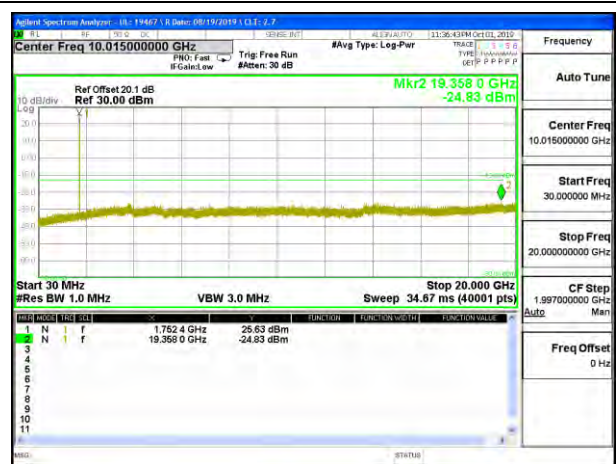
WCDMA Band 4 Rel 99 Middle Channel



WCDMA Band 4 HSDPA Middle Channel



WCDMA Band 4 Rel 99 High Channel



WCDMA Band 4 HSDPA High Channel

8.4. FREQUENCY STABILITY

RULE PART(S)

FCC: §2.1055, §22.355, §24.235, §27.54 and §90.213
IC: RSS132§5.3; RSS133§6.3 and RSS139§6.4

LIMITS

FCC §22.355, §90.213

The carrier frequency shall not depart from the reference frequency in excess of ± 2.5 ppm for mobile stations.

FCC §24.235 & §27.54

The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

RSS132§5.3

The carrier frequency shall not depart from the reference frequency in excess of ± 2.5 SRSP for mobile stations and ± 1.5 ppm for base stations.

In lieu of meeting the above stability values, the test report may show that the frequency stability is sufficient to ensure that the occupied bandwidth stays within each of the sub-bands (see Section 5.1) when tested to the temperature and supply voltage variations specified in RSS-Gen.

RSS133§6.3

The carrier frequency shall not depart from the reference frequency, in excess of ± 2.5 ppm for mobile stations and ± 1.0 ppm for base stations.

In lieu of meeting the above stability values, the test report may show that the frequency stability is sufficient to ensure that the emission bandwidth stays within the operating frequency block when tested to the temperature and supply voltage variations specified in RSS-Gen.

RSS139§6.4

The frequency stability shall be sufficient to ensure that the occupied bandwidth stays within the operating frequency block when tested to the temperature and supply voltage variations specified in RSS-Gen.

TEST PROCEDURE

Use CMW 500 with Frequency Error measurement capability.

- Temp. = -30°C to $+50^{\circ}\text{C}$
- Voltage = (85% - 115%)

Low voltage, 3.23VDC, Normal, 3.8VDC and High voltage, 4.37VDC.
End Voltage, 3.2VDC.

Frequency Stability vs Temperature:

The EUT is placed inside a temperature chamber. The temperature is set to 20°C and allowed to stabilize. After sufficient soak time, the transmitting frequency error is measured. The temperature is increased by 10 degrees, allowed to stabilize and soak, and then the measurement is repeated. This is repeated until $+50^{\circ}\text{C}$ is reached.

Frequency Stability vs Voltage:

The peak frequency error is recorded (worst-case).

RESULTS

See the following pages.

8.4.1. GSM

ID:	38602	Date:	10/18/19
------------	-------	--------------	----------

GPRS 850

Limit		824	849	Delta (Hz)	Frequency Stability (ppm)
Condition		F low @ -13dBm (MHz)	F high @ -13dBm (MHz)		
Temperature	Voltage				
Normal (20C)	Normal	824.0614	848.9418		
Extreme (50C)		824.0614	848.9418	-7.3	-0.009
Extreme (40C)		824.0614	848.9418	3.8	0.005
Extreme (30C)		824.0614	848.9418	4.3	0.005
Extreme (10C)		824.0614	848.9418	-5.2	-0.006
Extreme (0C)		824.0614	848.9418	-4.9	-0.006
Extreme (-10C)		824.0614	848.9418	-3.5	-0.004
Extreme (-20C)		824.0614	848.9418	-4.9	-0.006
Extreme (-30C)		824.0614	848.9418	-5.6	-0.007
20C	15%	824.0614	848.9418	3.6	0.004
	-15%	824.0614	848.9418	2.1	0.003
	End Point	824.0614	848.9418	-1.3	-0.002

GPRS 1900

Limit		1850	1910	Delta (Hz)	Frequency Stability (ppm)
Condition		F low @ -13dBm (MHz)	F high @ -13dBm (MHz)		
Temperature	Voltage				
Normal (20C)	Normal	1850.0576	1909.9387		
Extreme (50C)		1850.0576	1909.9387	-7.6	-0.004
Extreme (40C)		1850.0576	1909.9387	-9.9	-0.005
Extreme (30C)		1850.0576	1909.9387	-8.3	-0.004
Extreme (10C)		1850.0576	1909.9387	-4.8	-0.003
Extreme (0C)		1850.0576	1909.9387	-3.2	-0.002
Extreme (-10C)		1850.0576	1909.9387	-2.1	-0.001
Extreme (-20C)		1850.0576	1909.9387	-4.4	-0.002
Extreme (-30C)		1850.0576	1909.9387	-3.9	-0.002
20C	15%	1850.0576	1909.9387	-8.3	-0.004
	-15%	1850.0576	1909.9387	-6.6	-0.004
	End Point	1850.0576	1909.9387	-3.5	-0.002

8.4.2. CDMA2000

ID:	38602	Date:	10/25/19
------------	-------	--------------	----------

CDMA 1xRTT BC0

Limit		824	849	Delta (Hz)	Frequency Stability (ppm)
Condition		F low @ -13dBm (MHz)	F high @ -13dBm (MHz)		
Temperature	Voltage				
Normal (20C)	Normal	824.0126	848.9964		
Extreme (50C)		824.0126	848.9964	1.8	0.002
Extreme (40C)		824.0126	848.9964	0.9	0.001
Extreme (30C)		824.0126	848.9964	-0.8	-0.001
Extreme (10C)		824.0126	848.9964	-2.5	-0.003
Extreme (0C)		824.0126	848.9964	-1.1	-0.001
Extreme (-10C)		824.0126	848.9964	0.3	0.000
Extreme (-20C)		824.0126	848.9964	-1.5	-0.002
Extreme (-30C)		824.0126	848.9964	-0.9	-0.001
20C	15%	824.0126	848.9964	-1.0	-0.001
	-15%	824.0126	848.9964	-0.8	-0.001
	End Point	824.0126	848.9964	-1.6	-0.002

CDMA 1xRTT BC1

Limit		1850	1910	Delta (Hz)	Frequency Stability (ppm)
Condition		F low @ -13dBm (MHz)	F high @ -13dBm (MHz)		
Temperature	Voltage				
Normal (20C)	Normal	1850.5644	1909.4407		
Extreme (50C)		1850.5644	1909.4407	-1.9	-0.001
Extreme (40C)		1850.5644	1909.4407	1.4	0.001
Extreme (30C)		1850.5644	1909.4407	1.2	0.001
Extreme (10C)		1850.5644	1909.4407	-1.5	-0.001
Extreme (0C)		1850.5644	1909.4407	2.2	0.001
Extreme (-10C)		1850.5644	1909.4407	1.7	0.001
Extreme (-20C)		1850.5644	1909.4407	-1.6	-0.001
Extreme (-30C)		1850.5644	1909.4407	1.3	0.001
20C	15%	1850.5644	1909.4407	-1.7	-0.001
	-15%	1850.5644	1909.4407	1.1	0.001
	End Point	1850.5644	1909.4407	1.3	0.001

CDMA 1xRTT BC10

Limit		816	824	Delta (Hz)	Frequency Stability (ppm)
Condition		F low @ -13dBm (MHz)	F high @ -13dBm (MHz)		
Temperature	Voltage				
Normal (20C)	Normal	816.5684	823.4365		
Extreme (50C)		816.5684	823.4365	-1.3	-0.002
Extreme (40C)		816.5684	823.4365	-1.0	-0.001
Extreme (30C)		816.5684	823.4365	-0.6	-0.001
Extreme (10C)		816.5684	823.4365	-0.8	-0.001
Extreme (0C)		816.5684	823.4365	-1.3	-0.002
Extreme (-10C)		816.5684	823.4365	0.5	0.001
Extreme (-20C)		816.5684	823.4365	0.7	0.001
Extreme (-30C)		816.5684	823.4365	-1.1	-0.001
20C	15%	816.5684	823.4365	0.3	0.000
	-15%	816.5684	823.4365	0.4	0.000
	End Point	816.5684	823.4365	0.7	0.001

8.4.3. UMTS

ID:	38602	Date:	10/18/19
-----	-------	-------	----------

UMTS REL99 BAND 2

Limit		1850	1910	Delta (Hz)	Frequency Stability (ppm)
Condition		F low @ -13dBm (MHz)	F high @ -13dBm (MHz)		
Temperature	Voltage				
Normal (20C)	Normal	1850.1989	1909.8066		
Extreme (50C)		1850.1989	1909.8066	-0.9	0.000
Extreme (40C)		1850.1989	1909.8066	-1.2	-0.001
Extreme (30C)		1850.1989	1909.8066	0.3	0.000
Extreme (10C)		1850.1989	1909.8066	-0.5	0.000
Extreme (0C)		1850.1989	1909.8066	-1.1	-0.001
Extreme (-10C)		1850.1989	1909.8066	-0.4	0.000
Extreme (-20C)		1850.1989	1909.8066	-0.8	0.000
Extreme (-30C)		1850.1989	1909.8066	0.2	0.000
20C	15%	1850.1989	1909.8066	0.2	0.000
	-15%	1850.1989	1909.8066	-0.7	0.000
	End Point	1850.1989	1909.8066	-0.3	0.000

UMTS REL99 BAND 4

Limit		1710	1755	Delta (Hz)	Frequency Stability (ppm)
Condition		F low @ -13dBm	F high @ -13dBm		
Temperature	Voltage	(MHz)	(MHz)		
Normal (20C)	Normal	1710.1569	1754.8133		
Extreme (50C)		1710.1569	1754.8133	15.5	0.009
Extreme (40C)		1710.1569	1754.8133	12.6	0.007
Extreme (30C)		1710.1569	1754.8133	13.8	0.008
Extreme (10C)		1710.1569	1754.8133	14.1	0.008
Extreme (0C)		1710.1569	1754.8133	3.2	0.002
Extreme (-10C)		1710.1569	1754.8133	-1.5	-0.001
Extreme (-20C)		1710.1569	1754.8133	-2.2	-0.001
Extreme (-30C)		1710.1569	1754.8133	1.4	0.001
20C	15%	1710.1569	1754.8133	12.1	0.007
	-15%	1710.1569	1754.8133	-2.7	-0.002
	End Point	1710.1569	1754.8133	10.3	0.006

UMTS REL99 BAND 5

Limit		824	849	Delta (Hz)	Frequency Stability (ppm)
Condition		F low @ -13dBm	F high @ -13dBm		
Temperature	Voltage	(MHz)	(MHz)		
Normal (20C)	Normal	824.1635	848.8117		
Extreme (50C)		824.1635	848.8117	-1.1	-0.001
Extreme (40C)		824.1635	848.8117	-0.4	0.000
Extreme (30C)		824.1635	848.8117	-0.8	-0.001
Extreme (10C)		824.1635	848.8117	-0.6	-0.001
Extreme (0C)		824.1635	848.8117	-1.2	-0.001
Extreme (-10C)		824.1635	848.8117	-0.4	0.000
Extreme (-20C)		824.1635	848.8117	-0.7	-0.001
Extreme (-30C)		824.1635	848.8117	-1.4	-0.002
20C	15%	824.1635	848.8117	0.4	0.000
	-15%	824.1635	848.8117	-0.8	-0.001
	End Point	824.1635	848.8117	-1.3	-0.002

8.5. PEAK-TO-AVERAGE POWER RATIO

LIMIT

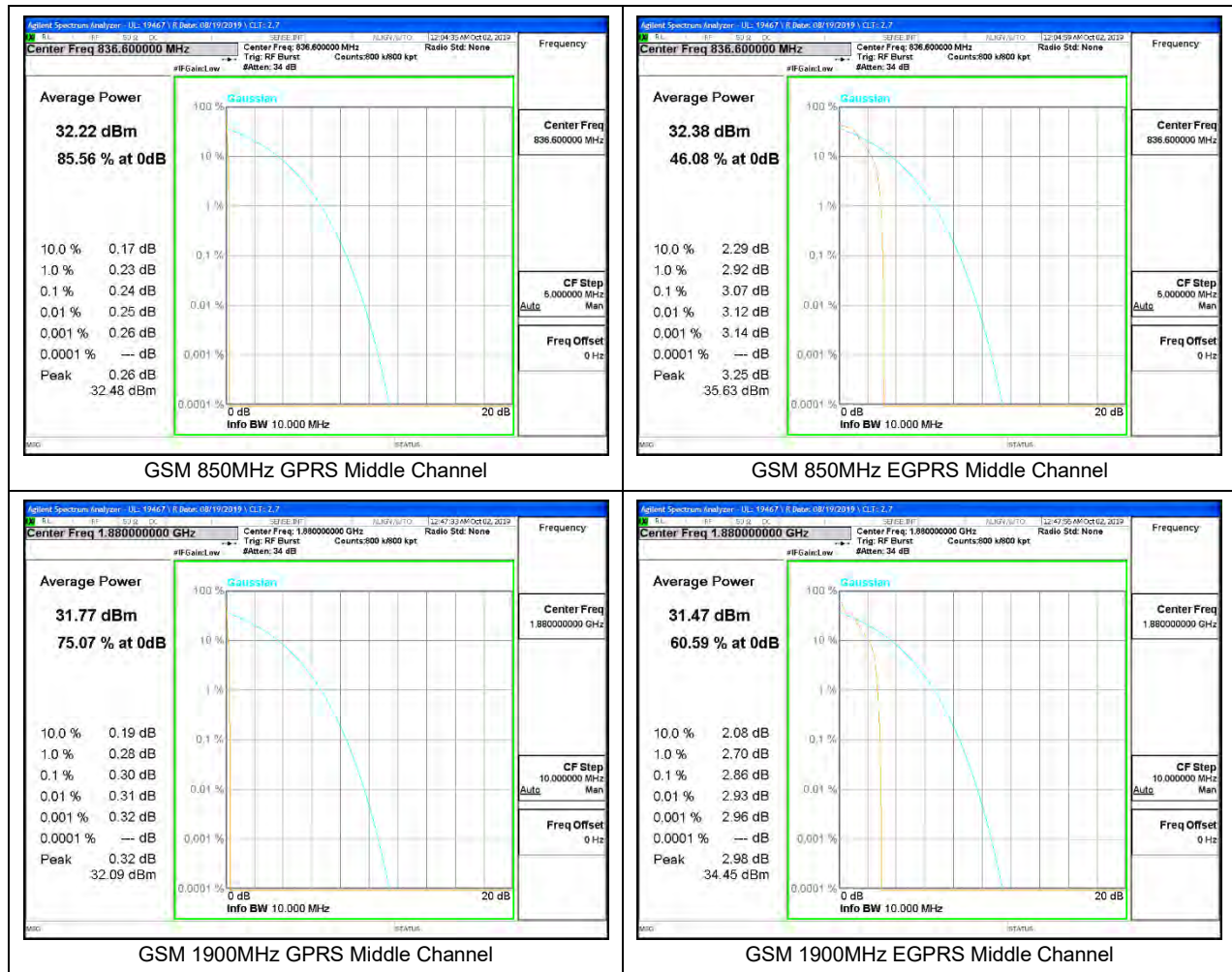
In addition, the peak-to-average power ratio (PAPR) of the transmitter shall not exceed 13 dB for more than 0.1% of the time and shall use a signal corresponding to the highest PAPR during periods of continuous transmission.

RESULT

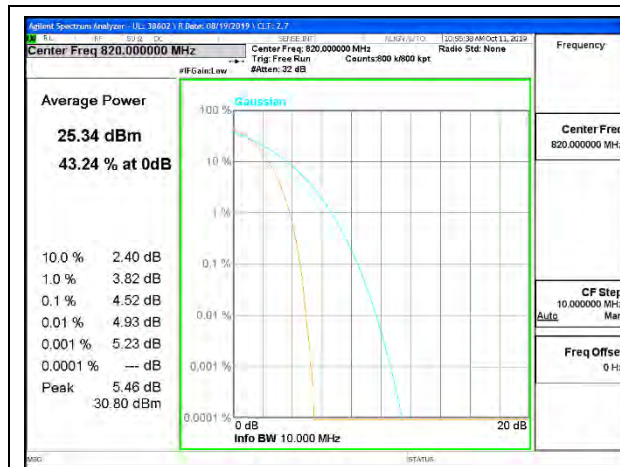
ANT 1 antenna was used to measure as the worst case. The results from all CCDF plots are passed with 13dB peak-to-average power ratio criteria.

ID:	19467	Date:	10/2/19
------------	-------	--------------	---------

8.5.1. GSM



8.5.2. CDMA



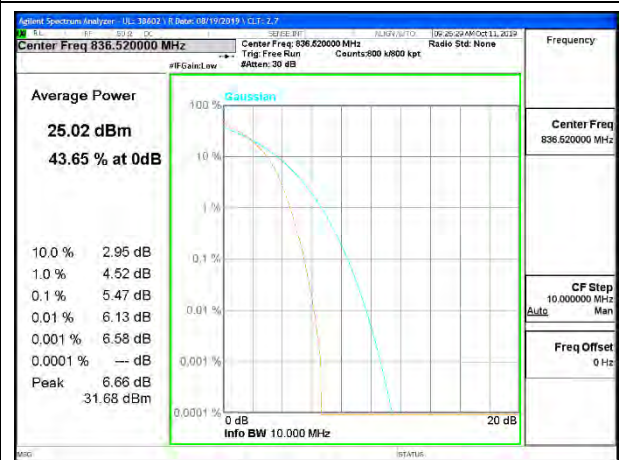
CDMA BC10 1xRTT Middle Channel



CDMA BC10 1xEV-DO Rev A Middle Channel



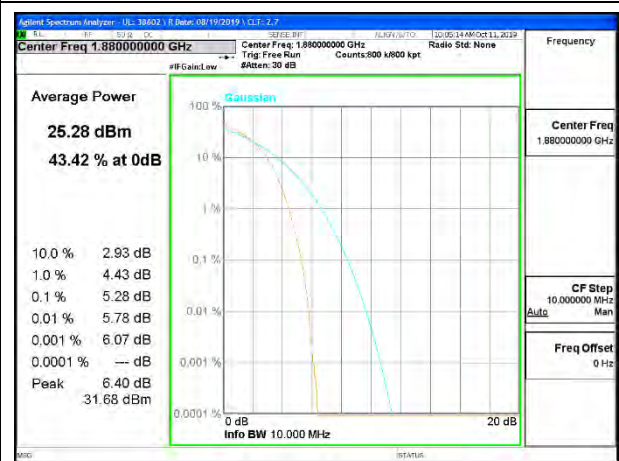
CDMA BC0 1xRTT Middle Channel



CDMA BC0 1xEV-DO Rev A Middle Channel



CDMA BC1 1xRTT Middle Channel



CDMA BC1 1xEV-DO Rev A Middle Channel

8.5.3. WCDMA



WCDMA Band 5 Rel 99 Middle Channel



WCDMA Band 5 HSDPA Middle Channel



WCDMA Band 2 Rel 99 Middle Channel



WCDMA Band 2 HSDPA Middle Channel



WCDMA Band 4 Rel 99 Middle Channel



WCDMA Band 4 HSDPA Middle Channel

9. RADIATED TEST RESULTS

9.1. FIELD STRENGTH OF SPURIOUS RADIATION, LAT 1

RULE PART(S)

FCC: §2.1053, §22.917, §24.238, §27.53 and §90.691.
IC: RSS132§5.5; RSS133§6.5 and RSS139§6.6

LIMIT

FCC: §22.917(a), §24.238(a), §27.53 (h), §90.691

The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log (P)$ dB.

RSS132§5.5

Mobile and base station equipment shall comply with the limits in (i) and (ii) below.

- (i) In the first 1.0 MHz band immediately outside and adjacent to each of the sub-bands specified in Section 5.1, the power of emissions per any 1% of the occupied bandwidth shall be attenuated (in dB) below the transmitter output power P (dBW) by at least $43 + 10 \log_{10} p$ (watts).
- (ii) After the first 1.0 MHz immediately outside and adjacent to each of the sub-bands, the power of emissions in any 100 kHz bandwidth shall be attenuated (in dB) below the transmitter output power P (dBW) by at least $43 + 10 \log_{10} p$ (watts). If the measurement is performed using 1% of the occupied bandwidth, power integration over 100 kHz is required.

RSS133§6.5

Equipment shall comply with the limits in (i) and (ii) below.

- (i) In the 1.0 MHz bands immediately outside and adjacent to the equipment's operating frequency block, the emission power per any 1% of the emission bandwidth shall be attenuated (in dB) below the transmitter output power P (dBW) by at least $43 + 10 \log_{10} p$ (watts).
- (ii) After the first 1.0 MHz, the emission power in any 1 MHz bandwidth shall be attenuated (in dB) below the transmitter output power P (dBW) by at least $43 + 10 \log_{10} p$ (watts). If the measurement is performed using 1% of the emission bandwidth, power integration over 1.0 MHz is required.

RSS139§6.6

- (i) In the first 1.0 MHz bands immediately outside and adjacent to the equipment's smallest operating frequency block, Footnote 2 which can contain the equipment's occupied bandwidth, the emission power per any 1% of the emission bandwidth shall be attenuated below the transmitter output power P (in dBW) by at least $43 + 10 \log_{10} p$ (watts) dB.
- (ii) After the first 1.0 MHz outside the equipment's smallest operating frequency block, which can contain the equipment's occupied bandwidth, the emission power in any 1 MHz bandwidth shall be attenuated below the transmitter output power P (in dBW) by at least $43 + 10 \log_{10} p$ (watts) dB.

TEST PROCEDURE

KDB 971168 D01

RESULTS

9.1.1. GSM

GSM 850MHz

Company:	
Project #:	13018918
Date:	9/3/2019
Test Engineer:	50822
Configuration:	EUT Only
Mode:	GSM850 GPRS
Chamber #:	Chamber B

Frequency (GHz)	Meter Reading (dBm)	Det	AF T344 (dB/m)	Amp/Cbl (dB)	Amp/Cbl (dB)	Corrected Reading (dBm)	LIMIT	Margin (dB)	Polarity
Low Channel, 824.2MHz									
1.83	-68.06	Pk	30.3	-29.5	11.4	-55.86	-13	-42.86	H
2.038	-67.02	Pk	30.9	-29.1	10.5	-54.72	-13	-41.72	V
2.565	-67.86	Pk	32.3	-28.5	9.4	-54.66	-13	-41.66	V
3.033	-68.57	Pk	32.9	-27.6	10.9	-52.37	-13	-39.37	H
3.1	-69.26	Pk	33	-27.7	10.6	-53.36	-13	-40.36	V
3.947	-68.79	Pk	33.5	-26.7	10	-51.99	-13	-38.99	H
Mid Channel, 836.6MHz									
1.641	-67.67	Pk	28.4	-29.9	10.8	-58.37	-13	-45.37	H
1.987	-67.8	Pk	31	-29.1	11.2	-54.7	-13	-41.7	V
2.138	-68.15	Pk	31.4	-28.9	11.6	-54.05	-13	-41.05	H
3.097	-68.52	Pk	33	-27.6	10.6	-52.52	-13	-39.52	V
3.7	-69.12	Pk	33.1	-26.8	10.3	-52.52	-13	-39.52	H
4.4	-69.47	Pk	33.6	-25.8	9.9	-51.77	-13	-38.77	V
High Channel, 848.8MHz									
1.974	-67.04	Pk	31.1	-29.3	10.2	-55.04	-13	-42.04	V
2.09	-67.39	Pk	31.1	-28.9	11.3	-53.89	-13	-40.89	H
2.989	-68.75	Pk	32.7	-27.8	10.2	-53.65	-13	-40.65	H
3.098	-68.64	Pk	33	-27.7	10.6	-52.74	-13	-39.74	V
4.474	-69.88	Pk	33.8	-25.7	9.7	-52.08	-13	-39.08	H
4.598	-69.37	Pk	34.2	-26.2	9	-52.37	-13	-39.37	V

Pk - Peak detector

Company:	
Project #:	13018918
Date:	9/3/2019
Test Engineer:	50822
Configuration:	EUT Only
Mode:	GSM850 EGPRS
Chamber #:	Chamber B

Frequency (GHz)	Meter Reading (dBm)	Det	AF T344 (dB/m)	Amp/Cbl (dB)	Amp/Cbl (dB)	Corrected Reading (dBm)	LIMIT	Margin (dB)	Polarity
Low Channel, 824.2MHz									
1.923	-67.15	Pk	30.7	-29.3	10.2	-55.55	-13	-42.55	H
1.975	-67.45	Pk	31.1	-29.3	10.4	-55.25	-13	-42.25	V
2.461	-67.94	Pk	32.3	-28.6	8.8	-55.44	-13	-42.44	H
3.131	-67.73	Pk	33.1	-27.6	10.1	-52.13	-13	-39.13	V
3.686	-69.16	Pk	33.1	-26.7	10.3	-52.46	-13	-39.46	H
3.874	-68.62	Pk	33.6	-26.7	9.5	-52.22	-13	-39.22	V
Mid Channel, 836.6MHz									
1.825	-67.59	Pk	30.3	-29.5	11.2	-55.59	-13	-42.59	H
1.83	-68.25	Pk	30.3	-29.5	10.4	-57.05	-13	-44.05	V
2.034	-67.8	Pk	30.8	-29	10.5	-55.5	-13	-42.5	V
2.09	-67.46	Pk	31.1	-28.9	11.3	-53.96	-13	-40.96	H
2.678	-68.62	Pk	32.3	-28.1	10.3	-54.12	-13	-41.12	V
3.034	-68.74	Pk	32.8	-27.7	10.9	-52.74	-13	-39.74	H
High Channel, 848.8MHz									
2.096	-67.27	Pk	31.2	-28.9	10.9	-54.07	-13	-41.07	H
2.151	-67.47	Pk	31.3	-28.9	10.5	-54.57	-13	-41.57	V
2.971	-68.22	Pk	32.6	-27.8	9.6	-53.82	-13	-40.82	V
3.268	-68.95	Pk	32.9	-27.2	9.9	-53.35	-13	-40.35	H
4.97	-70.11	Pk	34.2	-25.2	8.5	-52.61	-13	-39.61	H
6.353	-70.26	Pk	35.5	-23.6	7.8	-50.56	-13	-37.56	V

Pk - Peak detector

GSM 1900MHz

Company:	
Project #:	13018918
Date:	9/3/2019
Test Engineer:	50822
Configuration:	EUT Only
Mode:	GSM1900 GPRS
Chamber #:	Chamber B

Frequency (GHz)	Meter Reading (dBm)	Det	AF T344 (dB/m)	Amp/Cbl (dB)	Amp/Cbl (dB)	Corrected Reading (dBm)	LIMIT	Margin (dB)	Polarity
Low Channel, 1850.2MHz									
2.121	-67.5	Pk	31.3	-28.7	9.9	-55	-13	-42	V
2.319	-68.34	Pk	31.7	-28.8	11	-54.44	-13	-41.44	H
3.536	-68.3	Pk	32.9	-26.9	9.6	-52.7	-13	-39.7	V
3.855	-68.41	Pk	33.6	-26.7	9.5	-52.01	-13	-39.01	H
4.46	-68.74	Pk	33.7	-25.7	10.2	-50.54	-13	-37.54	V
7.003	-70.81	Pk	35.7	-23.2	6.9	-51.41	-13	-38.41	H
Mid Channel, 1880MHz									
2.677	-68.55	Pk	32.3	-28	10.3	-53.95	-13	-40.95	V
3.222	-69	Pk	32.8	-27.4	9.7	-53.9	-13	-40.9	H
3.778	-69.47	Pk	33.4	-26.8	9.9	-52.97	-13	-39.97	V
4.609	-69.72	Pk	34.1	-26.2	9.2	-52.62	-13	-39.62	H
5.56	-69.55	Pk	34.7	-25	9	-50.85	-13	-37.85	V
7.161	-70.77	Pk	35.7	-22.9	7.3	-50.67	-13	-37.67	H
High Channel, 1909.8MHz									
2.409	-68.32	Pk	32	-28.6	9.6	-55.32	-13	-42.32	V
3.104	-68.98	Pk	33	-27.5	9.7	-53.78	-13	-40.78	H
3.669	-69.09	Pk	33	-26.7	10.6	-52.19	-13	-39.19	V
4.511	-70.04	Pk	34	-25.8	10.2	-51.64	-13	-38.64	H
5.615	-69.82	Pk	34.7	-24.9	8.7	-51.32	-13	-38.32	V
5.978	-70.78	Pk	35.3	-24.5	8	-51.98	-13	-38.98	H

Pk - Peak detector

Company:	
Project #:	13018918
Date:	9/3/2019
Test Engineer:	50822
Configuration:	EUT Only
Mode:	GSM1900 EGPRS
Chamber #:	Chamber B

Frequency (GHz)	Meter Reading (dBm)	Det	AF T344 (dB/m)	Amp/Cbl (dB)	Amp/Cbl (dB)	Corrected Reading (dBm)	LIMIT	Margin (dB)	Polarity
Low Channel, 1850.2MHz									
2.124	-68.05	Pk	31.3	-28.6	10.3	-55.05	-13	-42.05	V
2.142	-68.59	Pk	31.4	-28.8	11.1	-54.89	-13	-41.89	H
3.797	-68.36	Pk	33.5	-26.8	9.4	-52.26	-13	-39.26	V
3.933	-68.75	Pk	33.5	-26.6	9.8	-52.05	-13	-39.05	H
5.095	-69.47	Pk	34.2	-25.2	9.2	-51.27	-13	-38.27	H
5.112	-69.97	Pk	34.2	-25.2	9.2	-51.77	-13	-38.77	V
Mid Channel, 1880MHz									
3.001	-68.92	Pk	32.8	-27.8	9.7	-54.22	-13	-41.22	H
3.065	-68.51	Pk	33	-27.6	9.4	-53.71	-13	-40.71	V
4.528	-69.76	Pk	34.1	-25.9	10.2	-51.36	-13	-38.36	V
4.582	-68.38	Pk	34.1	-26.1	10	-50.38	-13	-37.38	H
5.985	-70.64	Pk	35.2	-24.4	8.1	-51.74	-13	-38.74	H
6.466	-71.38	Pk	35.6	-23.8	7.3	-52.28	-13	-39.28	V
High Channel, 1909.8MHz									
2.2	-68.84	Pk	31.5	-28.9	9.9	-56.34	-13	-43.34	V
3.242	-68.27	Pk	32.8	-27.3	10	-52.77	-13	-39.77	H
4.528	-69.35	Pk	34.1	-25.9	10.2	-50.95	-13	-37.95	V
4.535	-68.96	Pk	34.1	-25.8	9.8	-50.86	-13	-37.86	H
8.022	-71.74	Pk	35.7	-21.9	7.8	-50.14	-13	-37.14	H
8.893	-72.51	Pk	36.1	-20.4	8.5	-48.31	-13	-35.31	V

Pk - Peak detector

9.1.2. CDMA

CDMA BC10

Company:	
Project #:	13018918
Date:	9/5/2019
Test Engineer:	12492
Configuration:	EUT Only
Mode:	CDMA BC10 1xRTT
Chamber #:	Chamber B

Frequency (GHz)	Meter Reading (dBm)	Det	AF T344 (dB/m)	Amp/Cbl (dB)	Amp/Cbl (dB)	Corrected Reading (dBm)	LIMIT	Margin (dB)	Polarity
Low Channel, 817.25 MHz									
1.634	-64.89	Pk	28.3	-29.9	10.5	-55.99	-13	-42.99	H
1.635	-64.36	Pk	28.3	-29.9	10.6	-55.36	-13	-42.36	V
2.453	-68.09	Pk	32.2	-28.6	9.1	-55.39	-13	-42.39	V
2.456	-67.82	Pk	32.2	-28.6	8.6	-55.62	-13	-42.62	H
3.27	-68.94	Pk	32.9	-27.3	10	-53.34	-13	-40.34	H
3.273	-68.62	Pk	32.9	-27.2	9.1	-53.82	-13	-40.82	V
Mid Channel, 820 MHz									
1.641	-68.46	Pk	28.4	-29.9	10.8	-59.16	-13	-46.16	H
1.642	-68.23	Pk	28.4	-29.9	10.7	-59.03	-13	-46.03	V
2.46	-67.01	Pk	32.3	-28.6	9	-54.31	-13	-41.31	V
2.463	-57.18	Pk	32.3	-28.6	8.9	-44.58	-13	-31.58	H
3.277	-68.92	Pk	32.9	-27.2	9.1	-54.12	-13	-41.12	V
3.285	-69.36	Pk	32.9	-27.2	9.6	-54.06	-13	-41.06	H
High Channel, 822.75 MHz									
1.644	-68.43	Pk	28.5	-29.9	10.6	-59.23	-13	-46.23	V
1.645	-68.52	Pk	28.5	-29.9	11	-58.92	-13	-45.92	H
2.468	-67.48	Pk	32.3	-28.5	8.9	-54.78	-13	-41.78	H
2.468	-67.78	Pk	32.3	-28.5	8.8	-55.18	-13	-42.18	V
3.288	-69.24	Pk	32.8	-27.1	9.5	-54.04	-13	-41.04	V
3.289	-69.49	Pk	32.9	-27.1	9.7	-53.99	-13	-40.99	H

Pk - Peak detector

Company:	
Project #:	13018918
Date:	9/5/2019
Test Engineer:	39006
Configuration:	EUT Only
Mode:	CDMA BC10 1xEV-DO
Chamber #:	Chamber A

Frequency (GHz)	Meter Reading (dBm)	Det	AF T346 (dB/m)	Amp/Cbl (dB)	Amp/Cbl (dB)	Corrected Reading (dBm)	LIMIT	Margin (dB)	Polarity
Low Channel, 817.25 MHz									
1.628	-67.45	Pk	28.3	-29.8	10.1	-58.85	-13	-45.85	V
1.636	-67.38	Pk	28.3	-29.9	10.5	-58.48	-13	-45.48	H
2.461	-68.09	Pk	32.3	-28.6	8.8	-55.59	-13	-42.59	H
2.47	-68.49	Pk	32.3	-28.4	9	-55.59	-13	-42.59	V
3.258	-68.04	Pk	32.8	-27.3	10.3	-52.24	-13	-39.24	H
3.261	-67.96	Pk	32.8	-27.3	9.9	-52.56	-13	-39.56	V
Mid Channel, 820 MHz									
1.675	-70.34	Pk	28.7	-29.9	9	-62.54	-13	-49.54	V
1.679	-71.08	Pk	28.7	-29.7	10.7	-61.38	-13	-48.38	H
2.454	-71.15	Pk	32.2	-28.6	9	-58.55	-13	-45.55	V
2.464	-70.79	Pk	32.3	-28.6	8.9	-58.19	-13	-45.19	H
3.215	-71.64	Pk	32.8	-27.5	9.1	-57.24	-13	-44.24	V
3.239	-70.55	Pk	32.7	-27.3	9.9	-55.25	-13	-42.25	H
High Channel, 822.75 MHz									
1.659	-68.02	Pk	28.6	-29.8	9.2	-60.02	-13	-47.02	V
1.668	-67.15	Pk	28.6	-29.8	10.6	-57.75	-13	-44.75	H
2.504	-68.38	Pk	32.4	-28.5	9	-55.48	-13	-42.48	H
2.51	-68.92	Pk	32.4	-28.5	9.3	-55.72	-13	-42.72	V
3.391	-69.81	Pk	32.6	-27.3	8.7	-55.81	-13	-42.81	V
3.402	-69.69	Pk	32.6	-27.2	8.8	-55.49	-13	-42.49	H

Pk - Peak detector

CDMA BC0

Company:	
Project #:	13018918
Date:	9/4/2019
Test Engineer:	12492
Configuration:	EUT Only
Mode:	CDMA BC0 1xRTT
Chamber #:	Chamber B

Frequency (GHz)	Meter Reading (dBm)	Det	AF T344 (dB/m)	Amp/Cbl (dB)	Amp/Cbl (dB)	Corrected Reading (dBm)	LIMIT	Margin (dB)	Polarity
Low Channel, 824.70 MHz									
1.649	-60.67	Pk	28.5	-29.8	10.9	-51.07	-13	-38.07	H
1.65	-61.5	Pk	28.5	-29.8	10.1	-52.7	-13	-39.7	V
2.472	-67.89	Pk	32.3	-28.4	9	-54.99	-13	-41.99	V
2.474	-67.96	Pk	32.3	-28.4	8.8	-55.26	-13	-42.26	H
3.297	-68.95	Pk	32.9	-27.1	9.7	-53.45	-13	-40.45	H
3.299	-69.51	Pk	32.9	-27.1	9.9	-53.81	-13	-40.81	V
Mid Channel, 836.52 MHz									
1.673	-65.4	Pk	28.7	-29.9	10.6	-56	-13	-43	H
3.347	-68.96	Pk	32.8	-27.2	9.1	-54.26	-13	-41.26	H
1.674	-65.32	Pk	28.7	-29.9	9	-57.52	-13	-44.52	V
2.505	-67.89	Pk	32.4	-28.5	9.3	-54.69	-13	-41.69	V
2.507	-68.12	Pk	32.4	-28.5	9.1	-55.12	-13	-42.12	H
3.345	-68.85	Pk	32.8	-27.2	9.3	-53.95	-13	-40.95	V
High Channel, 848.31 MHz									
1.695	-66.08	Pk	28.7	-29.7	10.3	-56.78	-13	-43.78	H
1.692	-68.55	Pk	28.7	-29.7	9.7	-59.85	-13	-46.85	V
2.54	-68.63	Pk	32.3	-28.4	8.8	-55.93	-13	-42.93	H
2.546	-68.67	Pk	32.3	-28.3	8.9	-55.77	-13	-42.77	V
3.39	-68.89	Pk	32.6	-27.3	8.6	-54.99	-13	-41.99	H
3.396	-69.13	Pk	32.6	-27.3	8.9	-54.93	-13	-41.93	V

Pk - Peak detector

Company:	
Project #:	13018918
Date:	9/4/2019
Test Engineer:	12492
Configuration:	EUT Only
Mode:	CDMA BC0 1xEV-DO
Chamber #:	Chamber B

Frequency (GHz)	Meter Reading (dBm)	Det	AF T344 (dB/m)	Amp/Cbl (dB)	Amp/Cbl (dB)	Corrected Reading (dBm)	LIMIT	Margin (dB)	Polarity
Low Channel, 824.70 MHz									
3.702	-67.56	Pk	33.1	-26.8	10.2	-51.06	-13	-38.06	H
7.404	-71.75	Pk	35.5	-23	7	-52.25	-13	-39.25	H
3.704	-70.02	Pk	33.1	-26.8	9.9	-53.82	-13	-40.82	V
7.411	-71.2	Pk	35.5	-23	7.1	-51.6	-13	-38.6	V
5.554	-70.59	Pk	34.7	-25	8.9	-51.99	-13	-38.99	H
5.554	-70.6	Pk	34.7	-25	8.8	-52.1	-13	-39.1	V
Mid Channel, 836.52 MHz									
3.76	-73.15	Pk	33.4	-26.9	9.3	-57.35	-13	-44.35	H
7.514	-75.32	Pk	35.6	-22.8	7.6	-54.92	-13	-41.92	H
3.76	-71.77	Pk	33.4	-26.9	9.6	-55.67	-13	-42.67	V
7.514	-75.06	Pk	35.6	-22.8	7.6	-54.66	-13	-41.66	V
5.642	-74.01	Pk	34.8	-25	8.1	-56.11	-13	-43.11	H
5.644	-73.76	Pk	34.8	-25	7.8	-56.16	-13	-43.16	V
High Channel, 848.31 MHz									
3.818	-68.76	Pk	33.5	-26.9	9.6	-52.56	-13	-39.56	H
7.632	-71.7	Pk	35.7	-22.6	7.4	-51.2	-13	-38.2	H
3.815	-69.25	Pk	33.5	-26.9	9.8	-52.85	-13	-39.85	V
7.635	-71.04	Pk	35.6	-22.6	7.3	-50.74	-13	-37.74	V
5.726	-70.35	Pk	34.7	-24.4	8	-52.05	-13	-39.05	H
5.726	-70.1	Pk	34.7	-24.4	7.9	-51.9	-13	-38.9	V

Pk - Peak detector

CDMA BC1

Company:	
Project #:	13018918
Date:	9/5/2019
Test Engineer:	12492
Configuration:	EUT Only
Mode:	CDMA BC1 1xRTT
Chamber #:	Chamber B

Frequency (GHz)	Meter Reading (dBm)	Det	AF T344 (dB/m)	Amp/Cbl (dB)	Amp/Cbl (dB)	Corrected Reading (dBm)	LIMIT	Margin (dB)	Polarity
Low Channel, 1851.25 MHz									
3.702	-70.12	Pk	33	-26.8	10.2	-53.72	-13	-40.72	H
7.405	-71.31	Pk	35.5	-23	6.9	-51.91	-13	-38.91	H
3.703	-69.02	Pk	33.1	-26.8	9.7	-53.02	-13	-40.02	V
7.401	-71.86	Pk	35.5	-22.9	7.2	-52.06	-13	-39.06	V
5.554	-69.62	Pk	34.7	-25	8.8	-51.12	-13	-38.12	V
5.555	-70.22	Pk	34.7	-25	8.9	-51.62	-13	-38.62	H
Mid Channel, 1880 MHz									
3.76	-69.83	Pk	33.4	-26.9	9.3	-54.03	-13	-41.03	H
7.519	-72.19	Pk	35.6	-22.8	7.5	-51.89	-13	-38.89	H
3.758	-70.3	Pk	33.3	-26.9	9.6	-54.3	-13	-41.3	V
7.517	-71.87	Pk	35.6	-22.8	7.5	-51.57	-13	-38.57	V
5.639	-70.81	Pk	34.7	-24.9	8.3	-52.71	-13	-39.71	H
5.639	-70.34	Pk	34.7	-24.9	8.3	-52.24	-13	-39.24	V
High Channel, 1908.75 MHz									
3.82	-65.51	Pk	33.5	-26.9	9.6	-49.31	-13	-36.31	H
7.63	-66.43	Pk	35.7	-22.6	7.4	-45.93	-13	-32.93	H
3.818	-69.86	Pk	33.5	-26.9	9.9	-53.36	-13	-40.36	V
7.632	-66.4	Pk	35.7	-22.6	7.4	-45.9	-13	-32.9	V
5.721	-70.76	Pk	34.8	-24.6	7.7	-52.86	-13	-39.86	V
5.727	-65.82	Pk	34.7	-24.4	8	-47.52	-13	-34.52	H

Pk - Peak detector

Company:	
Project #:	13018918
Date:	9/4/2019
Test Engineer:	12492
Configuration:	EUT Only
Mode:	CDMA BC1 1xEV-DO
Chamber #:	Chamber B

Frequency (GHz)	Meter Reading (dBm)	Det	AF T346 (dB/m)	Amp/Cbl (dB)	Amp/Cbl (dB)	Corrected Reading (dBm)	LIMIT	Margin (dB)	Polarity
Low Channel, 1851.25 MHz									
1.649	-57.12	Pk	28.5	-29.8	10.9	-47.52	-13	-34.52	H
1.65	-55.82	Pk	28.5	-29.8	10.1	-47.02	-13	-34.02	V
2.472	-68.41	Pk	32.3	-28.4	9	-55.51	-13	-42.51	V
2.475	-67.66	Pk	32.3	-28.4	8.8	-54.96	-13	-41.96	H
3.29	-69.11	Pk	32.9	-27.2	9.7	-53.71	-13	-40.71	V
3.294	-69.19	Pk	32.9	-27.1	9.6	-53.79	-13	-40.79	H
Mid Channel, 1880 MHz									
1.673	-59.34	Pk	28.7	-29.9	10.6	-49.94	-13	-36.94	H
3.346	-69.63	Pk	32.8	-27.2	9.1	-54.93	-13	-41.93	H
1.673	-61.04	Pk	28.7	-29.9	9	-53.24	-13	-40.24	V
3.349	-68.6	Pk	32.8	-27.2	9.4	-53.6	-13	-40.6	V
2.508	-67.79	Pk	32.4	-28.5	9.3	-54.59	-13	-41.59	V
2.51	-67.8	Pk	32.4	-28.5	9.1	-54.8	-13	-41.8	H
High Channel, 1908.75 MHz									
1.697	-62.51	Pk	28.7	-29.7	10	-53.51	-13	-40.51	H
1.696	-63.15	Pk	28.7	-29.7	9.5	-54.65	-13	-41.65	V
2.543	-68.23	Pk	32.3	-28.3	8.9	-55.33	-13	-42.33	V
2.547	-68.04	Pk	32.3	-28.4	9.2	-54.94	-13	-41.94	H
3.392	-68.89	Pk	32.6	-27.3	8.7	-54.89	-13	-41.89	H
3.397	-69.11	Pk	32.6	-27.3	8.9	-54.91	-13	-41.91	V

Pk - Peak detector

9.1.3. WCDMA

WCDMA BAND 5

Company:	
Project #:	13018918
Date:	9/4/2019
Test Engineer:	12500
Configuration:	EUT Only
Mode:	WCDMA Band 5 Rel 99
Chamber #:	Chamber B

Frequency (GHz)	Meter Reading (dBm)	Det	AF T344 (dB/m)	Amp/Cbl (dB)	Amp/Cbl (dB)	Corrected Reading (dBm)	LIMIT	Margin (dB)	Polarity
Low Channel, 826.4MHz									
1.606	-67.6	Pk	28	-35.5	10.9	-64.2	-13	-51.2	H
2.421	-69.55	Pk	32.1	-35.3	11.3	-61.45	-13	-48.45	H
3.218	-67.28	Pk	32.8	-33.9	11	-57.38	-13	-44.38	H
1.602	-66.74	Pk	28	-35.5	11.5	-62.74	-13	-49.74	V
2.413	-67.8	Pk	32	-35.3	10.2	-60.9	-13	-47.9	V
3.225	-68.61	Pk	32.9	-33.9	11.3	-58.31	-13	-45.31	V
Mid Channel, 836.6MHz									
1.703	-66.38	Pk	29.2	-35.5	11.5	-61.18	-13	-48.18	H
2.553	-68.81	Pk	32.4	-35.3	10.2	-61.51	-13	-48.51	H
3.403	-69.03	Pk	32.9	-33.3	10.7	-58.73	-13	-45.73	H
1.700	-65.9	Pk	29.1	-35.5	11.7	-60.6	-13	-47.6	V
2.536	-67.94	Pk	32.4	-35.3	10.6	-60.24	-13	-47.24	V
3.401	-69.69	Pk	32.9	-33.4	11.1	-59.09	-13	-46.09	V
High Channel, 846.6MHz									
1.711	-66.75	Pk	29.3	-35.5	11.4	-61.55	-13	-48.55	H
2.549	-67.73	Pk	32.4	-35.3	10.1	-60.53	-13	-47.53	H
3.397	-68.09	Pk	32.9	-33.4	11	-57.59	-13	-44.59	H
1.706	-66.5	Pk	29.3	-35.5	12.1	-60.6	-13	-47.6	V
2.542	-67.7	Pk	32.4	-35.3	10.5	-60.1	-13	-47.1	V
3.394	-69.15	Pk	32.9	-33.4	11.2	-58.45	-13	-45.45	V

Pk - Peak detector

Company:	
Project #:	13018918
Date:	9/4/2019
Test Engineer:	12500
Configuration:	EUT Only
Mode:	WCDMA Band 5 HSDPA
Chamber #:	Chamber B

Frequency (GHz)	Meter Reading (dBm)	Det	AF T344 (dB/m)	Amp/Cbl (dB)	Amp/Cbl (dB)	Corrected Reading (dBm)	LIMIT	Margin (dB)	Polarity
Low Channel, 826.4MHz									
1.606	-65.66	Pk	28	-35.5	10.9	-62.26	-13	-49.26	H
2.413	-67.42	Pk	32	-35.3	10.7	-60.02	-13	-47.02	H
3.221	-69.57	Pk	32.8	-33.9	10.8	-59.87	-13	-46.87	H
1.605	-67.71	Pk	28	-35.5	11.6	-63.61	-13	-50.61	V
2.403	-67.34	Pk	31.9	-35.3	10.8	-59.94	-13	-46.94	V
3.202	-68.47	Pk	32.8	-33.9	11	-58.57	-13	-45.57	V
Mid Channel, 836.6MHz									
1.619	-67.05	Pk	28.2	-35.5	10.5	-63.85	-13	-50.85	H
2.424	-67.54	Pk	32.2	-35.3	11.3	-59.34	-13	-46.34	H
3.225	-68.57	Pk	32.9	-33.9	10.7	-58.87	-13	-45.87	H
1.619	-67.89	Pk	28.2	-35.5	11.9	-63.29	-13	-50.29	V
2.413	-66.96	Pk	32	-35.3	10.2	-60.06	-13	-47.06	V
3.228	-68.91	Pk	32.9	-33.9	11.2	-58.71	-13	-45.71	V
High Channel, 846.6MHz									
1.628	-66.38	Pk	28.4	-35.5	11.2	-62.28	-13	-49.28	H
2.429	-67.54	Pk	32.3	-35.3	11.3	-59.24	-13	-46.24	H
3.206	-68.2	Pk	32.8	-33.9	10.5	-58.8	-13	-45.8	H
1.623	-67.19	Pk	28.3	-35.5	12.2	-62.19	-13	-49.19	V
2.428	-68.19	Pk	32.3	-35.3	10.3	-60.89	-13	-47.89	V
3.202	-69.08	Pk	32.8	-33.9	11	-59.18	-13	-46.18	V

Pk - Peak detector

WCDMA BAND 2

Company:	
Project #:	13018918
Date:	9/4/2019
Test Engineer:	39006
Configuration:	EUT Only
Mode:	WCDMA Band 2 Rel 99
Chamber #:	Chamber B

Frequency (GHz)	Meter Reading (dBm)	Det	AF T344 (dB/m)	Amp/Cbl (dB)	Amp/Cbl (dB)	Corrected Reading (dBm)	LIMIT	Margin (dB)	Polarity
Low Channel, 1852.4MHz									
3.701	-65.76	Pk	33	-32.5	10.8	-54.46	-13	-41.46	H
5.557	-67.72	Pk	34.6	-29.9	10.9	-52.12	-13	-39.12	H
7.391	-70.23	Pk	35.6	-27	10.7	-50.93	-13	-37.93	H
3.674	-65.08	Pk	33	-32.6	11.2	-53.48	-13	-40.48	V
5.566	-68.41	Pk	34.6	-29.9	10.9	-52.81	-13	-39.81	V
7.359	-70.15	Pk	35.6	-27	10.5	-51.05	-13	-38.05	V
Mid Channel, 1880MHz									
3.720	-65.78	Pk	33	-32.6	10.5	-54.88	-13	-41.88	H
5.675	-68.19	Pk	34.8	-29.4	10.3	-52.49	-13	-39.49	H
7.451	-70.05	Pk	35.6	-26.8	10.6	-50.65	-13	-37.65	H
3.719	-66.36	Pk	33	-32.6	10.7	-55.26	-13	-42.26	V
5.646	-68.02	Pk	34.8	-29.4	10.5	-52.12	-13	-39.12	V
7.424	-69.48	Pk	35.6	-26.8	10.6	-50.08	-13	-37.08	V
High Channel, 1907.6MHz									
3.739	-65.53	Pk	33.1	-32.5	10.4	-54.53	-13	-41.53	H
5.673	-68.16	Pk	34.8	-29.4	10.4	-52.36	-13	-39.36	H
7.601	-70.72	Pk	35.7	-26.6	10.3	-51.32	-13	-38.32	H
3.719	-65.92	Pk	33	-32.6	10.7	-54.82	-13	-41.82	V
5.632	-68.62	Pk	34.8	-29.5	10.6	-52.72	-13	-39.72	V
7.571	-70.53	Pk	35.7	-26.6	10.7	-50.73	-13	-37.73	V

Pk - Peak detector

Company:	
Project #:	13018918
Date:	9/4/2019
Test Engineer:	39006
Configuration:	EUT Only
Mode:	WCDMA Band 2 HSDPA
Chamber #:	Chamber B

Frequency (GHz)	Meter Reading (dBm)	Det	AF T344 (dB/m)	Amp/Cbl (dB)	Amp/Cbl (dB)	Corrected Reading (dBm)	LIMIT	Margin (dB)	Polarity
Low Channel, 1852.4MHz									
3.729	-66.95	Pk	33.1	-32.6	10.3	-56.15	-13	-43.15	H
5.590	-67.64	Pk	34.7	-29.6	10.1	-52.44	-13	-39.44	H
7.549	-70.23	Pk	35.7	-26.7	10.2	-51.03	-13	-38.03	H
3.737	-66.51	Pk	33.1	-32.5	10.7	-55.21	-13	-42.21	V
5.567	-67.95	Pk	34.6	-29.9	10.9	-52.35	-13	-39.35	V
7.554	-70.04	Pk	35.7	-26.7	10.5	-50.54	-13	-37.54	V
Mid Channel, 1880MHz									
3.727	-66.32	Pk	33.1	-32.6	10.3	-55.52	-13	-42.52	H
5.554	-67.34	Pk	34.6	-29.9	10.7	-51.94	-13	-38.94	H
7.409	-69.87	Pk	35.6	-26.9	10.4	-50.77	-13	-37.77	H
3.727	-65.99	Pk	33.1	-32.6	10.7	-54.79	-13	-41.79	V
5.554	-66.67	Pk	34.6	-29.9	10.9	-51.07	-13	-38.07	V
7.443	-70.22	Pk	35.6	-26.7	10.7	-50.62	-13	-37.62	V
High Channel, 1907.6MHz									
3.798	-65.96	Pk	33.4	-32.4	10.4	-54.56	-13	-41.56	H
5.704	-68.16	Pk	34.9	-29.2	9.8	-52.66	-13	-39.66	H
7.459	-70.34	Pk	35.6	-26.8	10.5	-51.04	-13	-38.04	H
3.784	-66.19	Pk	33.4	-32.4	10.5	-54.69	-13	-41.69	V
5.684	-68.74	Pk	34.8	-29.4	10.6	-52.74	-13	-39.74	V
7.430	-70.33	Pk	35.6	-26.8	10.6	-50.93	-13	-37.93	V

Pk - Peak detector

WCDMA BAND 4

Company:	
Project #:	13018918
Date:	9/4/2019
Test Engineer:	39006
Configuration:	EUT Only
Mode:	WCDMA Band 4 Rel 99
Chamber #:	Chamber B

Frequency (GHz)	Meter Reading (dBm)	Det	AF T344 (dB/m)	Amp/Cbl (dB)	Amp/Cbl (dB)	Corrected Reading (dBm)	LIMIT	Margin (dB)	Polarity
Low Channel, 1712.4MHz									
3.425	-69.78	Pk	33	-33.3	11	-59.08	-13	-46.08	H
5.222	-67.39	Pk	34.3	-30.3	10.8	-52.59	-13	-39.59	H
6.940	-69.9	Pk	35.7	-27.3	10.3	-51.2	-13	-38.2	H
3.407	-64.9	Pk	33	-33.4	11.1	-54.2	-13	-41.2	V
5.228	-67.66	Pk	34.3	-30.2	10.8	-52.76	-13	-39.76	V
6.894	-69.5	Pk	35.8	-27.4	10.4	-50.7	-13	-37.7	V
Mid Channel, 1732.6MHz									
3.474	-69.25	Pk	33.1	-33.2	10.9	-58.45	-13	-45.45	H
5.331	-67.45	Pk	34.3	-30.2	11.1	-52.25	-13	-39.25	H
6.839	-70.66	Pk	35.8	-27.5	10.4	-51.96	-13	-38.96	H
3.477	-65.92	Pk	33.1	-33.2	10.7	-55.32	-13	-42.32	V
5.338	-66.98	Pk	34.4	-30.2	10.9	-51.88	-13	-38.88	V
6.822	-70.18	Pk	35.8	-27.5	10.5	-51.38	-13	-38.38	V
High Channel, 1752.6MHz									
3.461	-65.41	Pk	33.1	-33.2	11	-54.51	-13	-41.51	H
5.261	-67.55	Pk	34.3	-30.1	10.5	-52.85	-13	-39.85	H
6.895	-69.65	Pk	35.8	-27.4	10.2	-51.05	-13	-38.05	H
3.453	-65.64	Pk	33.1	-33.3	11.2	-54.64	-13	-41.64	V
5.228	-67.75	Pk	34.3	-30.2	10.8	-52.85	-13	-39.85	V
6.890	-69.83	Pk	35.7	-27.4	10.6	-50.93	-13	-37.93	V

Pk - Peak detector

Company:	
Project #:	13018918
Date:	9/4/2019
Test Engineer:	39006
Configuration:	EUT Only
Mode:	WCDMA Band 4 HSDPA
Chamber #:	Chamber B

Frequency (GHz)	Meter Reading (dBm)	Det	AF T344 (dB/m)	Amp/Cbl (dB)	Amp/Cbl (dB)	Corrected Reading (dBm)	LIMIT	Margin (dB)	Polarity
Low Channel, 1712.4MHz									
3.428	-64.62	Pk	33.1	-33.3	11	-53.82	-13	-40.82	H
5.236	-68.04	Pk	34.3	-30.1	10.5	-53.34	-13	-40.34	H
6.914	-69.67	Pk	35.8	-27.3	10.1	-51.07	-13	-38.07	H
3.407	-65.25	Pk	33	-33.4	11.1	-54.55	-13	-41.55	V
5.205	-67.19	Pk	34.2	-30.4	10.7	-52.69	-13	-39.69	V
6.932	-69.63	Pk	35.8	-27.4	10.5	-50.73	-13	-37.73	V
Mid Channel, 1732.6MHz									
3.467	-65.79	Pk	33.1	-33.3	11	-54.99	-13	-41.99	H
5.215	-66.71	Pk	34.3	-30.5	10.9	-52.01	-13	-39.01	H
6.878	-69.84	Pk	35.8	-27.4	10.4	-51.04	-13	-38.04	H
3.448	-65.43	Pk	33.1	-33.2	11.3	-54.23	-13	-41.23	V
5.209	-67.56	Pk	34.2	-30.4	10.7	-53.06	-13	-40.06	V
6.877	-69.6	Pk	35.8	-27.4	10.7	-50.5	-13	-37.5	V
High Channel, 1752.6MHz									
3.423	-65.3	Pk	33	-33.4	11	-54.7	-13	-41.7	H
5.266	-67.92	Pk	34.4	-30.1	10.7	-52.92	-13	-39.92	H
6.981	-70.04	Pk	35.7	-27.3	10.2	-51.44	-13	-38.44	H
3.387	-64.55	Pk	32.9	-33.4	11	-54.05	-13	-41.05	H
5.263	-68.37	Pk	34.3	-30	10.6	-53.47	-13	-40.47	H
6.974	-69.72	Pk	35.8	-27.3	10.1	-51.12	-13	-38.12	H

Pk - Peak detector

9.2. FIELD STRENGTH OF SPURIOUS RADIATION, UAT 1

9.2.1. GSM

GSM 850MHz

Company:	
Project #:	13018918
Date:	9/5/2019
Test Engineer:	12500
Configuration:	EUT Only
Mode:	GSM850 GPRS
Chamber #:	Chamber B

Frequency (GHz)	Meter Reading (dBm)	Det	AF T344 (dB/m)	Amp/Cbl (dB)	Amp/Cbl (dB)	Corrected Reading (dBm)	LIMIT	Margin (dB)	Polarity
Low Channel, 824.2MHz									
1.700	-66.26	Pk	29.1	-35.5	11.5	-61.16	-13	-48.16	H
2.542	-66.95	Pk	32.4	-35.3	9.9	-59.95	-13	-46.95	H
3.400	-68.31	Pk	32.9	-33.4	10.8	-58.01	-13	-45.01	H
1.695	-66.27	Pk	29	-35.5	11.9	-60.87	-13	-47.87	V
2.526	-67.03	Pk	32.5	-35.4	11	-58.93	-13	-45.93	V
3.399	-68.84	Pk	32.9	-33.4	11.1	-58.24	-13	-45.24	V
Mid Channel, 836.6MHz									
1.706	-67.51	Pk	29.3	-35.5	11.4	-62.31	-13	-49.31	H
2.548	-67.23	Pk	32.4	-35.3	10.1	-60.03	-13	-47.03	H
3.412	-68.76	Pk	33	-33.4	10.7	-58.46	-13	-45.46	H
1.695	-66.93	Pk	29	-35.5	11.9	-61.53	-13	-48.53	V
2.553	-66.56	Pk	32.4	-35.3	10.9	-58.56	-13	-45.56	V
3.390	-67.66	Pk	32.9	-33.3	11.1	-56.96	-13	-43.96	V
High Channel, 848.8MHz									
1.704	-67.58	Pk	29.3	-35.5	11.5	-62.28	-13	-49.28	H
2.567	-67.39	Pk	32.4	-35.2	10.7	-59.49	-13	-46.49	H
3.410	-67.98	Pk	33	-33.4	10.7	-57.68	-13	-44.68	H
1.695	-67	Pk	29	-35.5	11.9	-61.6	-13	-48.6	V
2.561	-67.8	Pk	32.5	-35.2	11.2	-59.3	-13	-46.3	V
3.403	-69.86	Pk	32.9	-33.3	11.1	-59.16	-13	-46.16	V

Pk - Peak detector

Company:	
Project #:	13018918
Date:	9/5/2019
Test Engineer:	12500
Configuration:	EUT Only
Mode:	GSM850 EGPRS
Chamber #:	Chamber B

Frequency (GHz)	Meter Reading (dBm)	Det	AF T344 (dB/m)	Amp/Cbl (dB)	Amp/Cbl (dB)	Corrected Reading (dBm)	LIMIT	Margin (dB)	Polarity
Low Channel, 824.2MHz									
1.708	-67.65	Pk	29.3	-35.5	11.4	-62.45	-13	-49.45	H
2.575	-66.26	Pk	32.5	-35.3	11	-58.06	-13	-45.06	H
3.399	-69.42	Pk	32.9	-33.4	10.9	-59.02	-13	-46.02	H
1.705	-67.73	Pk	29.3	-35.5	12	-61.93	-13	-48.93	V
2.579	-67.02	Pk	32.5	-35.3	11.3	-58.52	-13	-45.52	V
3.392	-69.8	Pk	32.9	-33.3	11.1	-59.1	-13	-46.1	V
Mid Channel, 836.6MHz									
1.711	-67.15	Pk	29.3	-35.5	11.4	-61.95	-13	-48.95	H
2.550	-67.41	Pk	32.4	-35.3	10.1	-60.21	-13	-47.21	H
3.449	-69.54	Pk	33.1	-33.2	11.1	-58.54	-13	-45.54	H
1.706	-67.28	Pk	29.3	-35.5	12.1	-61.38	-13	-48.38	V
2.537	-67.98	Pk	32.4	-35.3	10.5	-60.38	-13	-47.38	V
3.433	-69.56	Pk	33.1	-33.2	11.1	-58.56	-13	-45.56	V
High Channel, 848.8MHz									
1.711	-67.52	Pk	29.3	-35.5	11.4	-62.32	-13	-49.32	H
2.565	-67.14	Pk	32.4	-35.3	10.6	-59.44	-13	-46.44	H
3.398	-68.07	Pk	32.9	-33.4	10.9	-57.67	-13	-44.67	H
1.710	-66.72	Pk	29.3	-35.5	12.2	-60.72	-13	-47.72	V
2.562	-67.98	Pk	32.5	-35.2	11.2	-59.48	-13	-46.48	V
3.385	-68.44	Pk	33	-33.4	11.1	-57.74	-13	-44.74	V

Pk - Peak detector

GSM 1900MHz

Company:	
Project #:	13018918
Date:	9/5/2019
Test Engineer:	12482
Configuration:	EUT Only
Mode:	GSM1900 GPRS
Chamber #:	Chamber A

Frequency (GHz)	Meter Reading (dBm)	Det	AF T344 (dB/m)	Amp/Cbl (dB)	Amp/Cbl (dB)	Corrected Reading (dBm)	LIMIT	Margin (dB)	Polarity
Low Channel, 1850.2MHz									
3.854	-66.26	Pk	33.7	-28.6	11.7	-49.46	-13	-36.46	H
3.93	-66.05	Pk	33.6	-28.7	11.5	-49.65	-13	-36.65	V
7.154	-69.71	Pk	36.1	-24.3	10.7	-47.21	-13	-34.21	V
8.602	-70.76	Pk	36	-22.6	11.2	-46.16	-13	-33.16	H
16.555	-71.78	Pk	41.4	-18	11.5	-36.88	-13	-23.88	H
16.575	-71.87	Pk	41.4	-18.2	10.7	-37.97	-13	-24.97	V
Mid Channel, 1880MHz									
3.873	-66.35	Pk	33.6	-28.5	12	-49.25	-13	-36.25	H
3.877	-65.79	Pk	33.6	-28.5	12.1	-48.59	-13	-35.59	V
5.243	-67.85	Pk	34.8	-27.3	11	-49.35	-13	-36.35	H
6.42	-69.32	Pk	35.8	-25.2	10.3	-48.42	-13	-35.42	V
15.254	-71.33	Pk	40.1	-18.6	10.8	-39.03	-13	-26.03	H
16.562	-71.87	Pk	41.5	-18.1	11.1	-37.37	-13	-24.37	V
High Channel, 1909.8MHz									
3.693	-66.21	Pk	33.2	-28.8	11.6	-50.21	-13	-37.21	V
3.873	-65.32	Pk	33.6	-28.5	12	-48.22	-13	-35.22	H
7.369	-70.37	Pk	35.7	-23.6	11	-47.27	-13	-34.27	H
10.866	-72.19	Pk	38	-19.6	11.3	-42.49	-13	-29.49	V
13.624	-70.94	Pk	38.7	-19.5	11.3	-40.44	-13	-27.44	H
16.75	-71.65	Pk	41.6	-19.1	11	-38.15	-13	-25.15	V

Pk - Peak detector

Company:	
Project #:	13018918
Date:	9/6/2019
Test Engineer:	12492
Configuration:	EUT Only
Mode:	GSM1900 EGPRS
Chamber #:	Chamber A

Frequency (GHz)	Meter Reading (dBm)	Det	AF T344 (dB/m)	Amp/Cbl (dB)	Amp/Cbl (dB)	Corrected Reading (dBm)	LIMIT	Margin (dB)	Polarity
Low Channel, 1850.2MHz									
3.701	-66.42	Pk	33.2	-28.9	11.2	-50.92	-13	-37.92	H
7.403	-70.54	Pk	35.7	-23.5	10.4	-47.94	-13	-34.94	H
3.695	-67.08	Pk	33.2	-28.8	11.7	-50.98	-13	-37.98	V
7.399	-70.41	Pk	35.7	-23.5	10.9	-47.31	-13	-34.31	V
5.543	-68.75	Pk	34.8	-27.3	11.1	-50.15	-13	-37.15	H
5.547	-68.55	Pk	34.8	-27.3	11.1	-49.95	-13	-36.95	V
Mid Channel, 1880MHz									
3.76	-65.49	Pk	33.5	-28.9	11.6	-49.29	-13	-36.29	H
7.523	-70.2	Pk	35.7	-23.4	10.4	-47.5	-13	-34.5	H
3.755	-66.97	Pk	33.5	-28.9	11.3	-51.07	-13	-38.07	V
7.523	-70.54	Pk	35.7	-23.4	10.6	-47.64	-13	-34.64	V
5.64	-68.55	Pk	34.8	-27.1	10.7	-50.15	-13	-37.15	H
5.643	-68.18	Pk	34.9	-27.1	10.8	-49.58	-13	-36.58	V
High Channel, 1909.8MHz									
3.819	-66.59	Pk	33.7	-28.6	11.6	-49.89	-13	-36.89	H
7.634	-70.88	Pk	35.8	-23.4	10.7	-47.78	-13	-34.78	H
3.822	-67.15	Pk	33.7	-28.7	11.3	-50.85	-13	-37.85	V
7.638	-69.86	Pk	35.8	-23.4	11.2	-46.26	-13	-33.26	V
5.731	-68.32	Pk	34.9	-26.6	10.6	-49.42	-13	-36.42	V
5.733	-69.04	Pk	34.9	-26.6	10.6	-50.14	-13	-37.14	H

Pk - Peak detector

9.2.2. CDMA

CDMA BC10

Company:	
Project #:	13018918
Date:	9/11/2019
Test Engineer:	12492
Configuration:	EUT Only
Mode:	CDMA BC10 1xRTT
Chamber #:	Chamber A

Frequency (GHz)	Meter Reading (dBm)	Det	AF T346 (dB/m)	Amp/Cbl (dB)	Amp/Cbl (dB)	Corrected Reading (dBm)	LIMIT	Margin (dB)	Polarity
Low Channel, 817.25 MHz									
1.639	-66.35	Pk	28.6	-31.7	11.4	-58.05	-13	-45.05	V
1.639	-66.28	Pk	28.6	-31.7	12.1	-57.28	-13	-44.28	H
2.460	-66.58	Pk	32.6	-30.6	12.4	-52.18	-13	-39.18	H
2.464	-66.96	Pk	32.6	-30.6	11.3	-53.66	-13	-40.66	V
3.268	-68.28	Pk	33	-29.4	9.8	-54.88	-13	-41.88	H
3.272	-67.51	Pk	32.9	-29.4	10.5	-53.51	-13	-40.51	V
Mid Channel, 820 MHz									
1.641	-66.11	Pk	28.6	-31.7	12.3	-56.91	-13	-43.91	H
1.643	-65.79	Pk	28.6	-31.7	11.5	-57.39	-13	-44.39	V
2.456	-66.47	Pk	32.5	-30.5	12.4	-52.07	-13	-39.07	H
2.462	-66.56	Pk	32.6	-30.6	11.5	-53.06	-13	-40.06	V
3.280	-67.44	Pk	32.9	-29.4	10.6	-53.34	-13	-40.34	H
3.282	-67.48	Pk	32.9	-29.4	10.7	-53.28	-13	-40.28	V
High Channel, 822.75 MHz									
1.644	-66	Pk	28.7	-31.7	12.3	-56.7	-13	-43.7	H
1.652	-66.43	Pk	28.7	-31.6	11.2	-58.13	-13	-45.13	V
2.466	-67.13	Pk	32.6	-30.6	11.9	-53.23	-13	-40.23	H
2.468	-66.75	Pk	32.6	-30.6	11.1	-53.65	-13	-40.65	V
3.289	-66.99	Pk	32.9	-29.5	11.2	-52.39	-13	-39.39	V
3.291	-67.62	Pk	32.9	-29.5	11.1	-53.12	-13	-40.12	H

Pk - Peak detector

Company:	
Project #:	13018918
Date:	9/5/2019
Test Engineer:	39006
Configuration:	EUT Only
Mode:	CDMA BC10 1xEV-DO
Chamber #:	Chamber B

Frequency (GHz)	Meter Reading (dBm)	Det	AF T346 (dB/m)	Amp/Cbl (dB)	Amp/Cbl (dB)	Corrected Reading (dBm)	LIMIT	Margin (dB)	Polarity
Low Channel, 817.25 MHz									
1.621	-67.95	Pk	28.2	-29.8	10.2	-59.35	-13	-46.35	V
1.635	-67.06	Pk	28.3	-29.9	10.5	-58.16	-13	-45.16	H
2.428	-68.5	Pk	32.2	-28.6	8.3	-56.6	-13	-43.6	H
2.433	-68.97	Pk	32.2	-28.6	8.9	-56.47	-13	-43.47	V
3.295	-69.34	Pk	32.9	-27.1	9.6	-53.94	-13	-40.94	H
3.299	-69.39	Pk	32.9	-27.1	9.9	-53.69	-13	-40.69	V
Mid Channel, 820 MHz									
1.684	-67.34	Pk	28.7	-29.8	9.8	-58.64	-13	-45.64	V
1.687	-67.18	Pk	28.7	-29.8	10.6	-57.68	-13	-44.68	H
2.454	-68.29	Pk	32.2	-28.6	8.6	-56.09	-13	-43.09	H
2.468	-68.72	Pk	32.3	-28.5	8.8	-56.12	-13	-43.12	V
3.235	-69.33	Pk	32.8	-27.4	9.7	-54.23	-13	-41.23	H
3.235	-68.76	Pk	32.8	-27.4	9.3	-54.06	-13	-41.06	V
High Channel, 822.75 MHz									
1.638	-68.14	Pk	28.4	-29.9	10.6	-59.04	-13	-46.04	V
1.646	-67.01	Pk	28.5	-29.9	11	-57.41	-13	-44.41	H
2.449	-67.99	Pk	32.2	-28.6	9.3	-55.09	-13	-42.09	V
2.451	-67.78	Pk	32.2	-28.6	8.6	-55.58	-13	-42.58	H
3.312	-69.07	Pk	32.8	-27.1	9.6	-53.77	-13	-40.77	H
3.317	-69	Pk	32.8	-27.2	9.6	-53.8	-13	-40.8	V

Pk - Peak detector

CDMA BC0

Company:	
Project #:	13018918
Date:	9/11/2019
Test Engineer:	12492
Configuration:	EUT Only
Mode:	CDMA BC0 1xRTT
Chamber #:	Chamber A

Frequency (GHz)	Meter Reading (dBm)	Det	AF T346 (dB/m)	Amp/Cbl (dB)	Amp/Cbl (dB)	Corrected Reading (dBm)	LIMIT	Margin (dB)	Polarity
Low Channel, 824.70 MHz									
1.648	-66.02	Pk	28.7	-31.7	12.2	-56.82	-13	-43.82	H
1.649	-66.02	Pk	28.7	-31.7	11.2	-57.82	-13	-44.82	V
2.470	-66.43	Pk	32.6	-30.6	11.2	-53.23	-13	-40.23	V
2.471	-66.69	Pk	32.6	-30.6	11.7	-52.99	-13	-39.99	H
3.296	-68.01	Pk	32.9	-29.6	11.4	-53.31	-13	-40.31	H
3.299	-67.53	Pk	32.9	-29.5	11.3	-52.83	-13	-39.83	V
Mid Channel, 836.52 MHz									
1.674	-65.94	Pk	28.9	-31.5	12.5	-56.04	-13	-43.04	H
1.670	-65.73	Pk	28.8	-31.6	11.6	-56.93	-13	-43.93	V
2.512	-66.8	Pk	32.6	-30.7	11.5	-53.4	-13	-40.4	H
2.512	-66.95	Pk	32.6	-30.7	11.7	-53.35	-13	-40.35	V
3.342	-67.83	Pk	32.8	-29.3	10.5	-53.83	-13	-40.83	H
3.345	-67.66	Pk	32.8	-29.3	11	-53.16	-13	-40.16	V
High Channel, 848.31 MHz									
1.692	-66.51	Pk	28.8	-31.6	12.5	-56.81	-13	-43.81	H
1.693	-66.56	Pk	28.8	-31.6	12.2	-57.16	-13	-44.16	V
2.543	-66.37	Pk	32.6	-30.4	11.7	-52.47	-13	-39.47	V
2.551	-67.23	Pk	32.5	-30.5	12.4	-52.83	-13	-39.83	H
3.390	-67.78	Pk	32.7	-29	11.2	-52.88	-13	-39.88	H
3.394	-67.79	Pk	32.7	-29.1	11.1	-53.09	-13	-40.09	V

Pk - Peak detector

Company:	
Project #:	13018918
Date:	9/5/2019
Test Engineer:	39006
Configuration:	EUT Only
Mode:	CDMA BC0 1xEV-DO
Chamber #:	Chamber B

Frequency (GHz)	Meter Reading (dBm)	Det	AF T346 (dB/m)	Amp/Cbl (dB)	Amp/Cbl (dB)	Corrected Reading (dBm)	LIMIT	Margin (dB)	Polarity
Low Channel, 824.70 MHz									
1.637	-67.87	Pk	28.4	-29.9	10.6	-58.77	-13	-45.77	V
1.638	-67.88	Pk	28.4	-29.9	10.5	-58.88	-13	-45.88	H
2.418	-75.39	Pk	32.1	-28.7	9.2	-62.79	-13	-49.79	V
2.423	-68.27	Pk	32.1	-28.7	9.1	-55.77	-13	-42.77	H
3.301	-68.99	Pk	32.9	-27.1	9.8	-53.39	-13	-40.39	H
3.309	-69.42	Pk	32.8	-27.2	9.8	-54.02	-13	-41.02	V
Mid Channel, 836.52 MHz									
1.672	-72.06	Pk	28.7	-29.9	9	-64.26	-13	-51.26	V
1.683	-72.62	Pk	28.7	-29.7	11	-62.62	-13	-49.62	H
2.5	-72.45	Pk	32.4	-28.5	9.4	-59.15	-13	-46.15	V
2.512	-72.01	Pk	32.4	-28.6	9.1	-59.11	-13	-46.11	H
3.358	-72.32	Pk	32.8	-27.2	10	-56.72	-13	-43.72	V
3.365	-73.11	Pk	32.8	-27.1	9.5	-57.91	-13	-44.91	H
High Channel, 848.31 MHz									
1.738	-68.23	Pk	29.5	-29.6	9.9	-58.43	-13	-45.43	V
1.758	-68.06	Pk	29.6	-29.6	8	-60.06	-13	-47.06	H
2.574	-69.02	Pk	32.3	-28.4	9.8	-55.32	-13	-42.32	V
2.581	-68.52	Pk	32.3	-28.4	10	-54.62	-13	-41.62	H
3.39	-69.38	Pk	32.6	-27.3	8.6	-55.48	-13	-42.48	H
3.41	-69.18	Pk	32.7	-27.1	9.3	-54.28	-13	-41.28	V

Pk - Peak detector

CDMA BC1

Company:	
Project #:	13018918
Date:	9/11/2019
Test Engineer:	12492
Configuration:	EUT Only
Mode:	CDMA BC1 1xRTT
Chamber #:	Chamber A

Frequency (GHz)	Meter Reading (dBm)	Det	AF T346 (dB/m)	Amp/Cbl (dB)	Amp/Cbl (dB)	Corrected Reading (dBm)	LIMIT	Margin (dB)	Polarity
Low Channel, 1851.25 MHz									
3.700	-66.29	Pk	33.2	-28.9	11.2	-50.79	-13	-37.79	H
7.403	-71.2	Pk	35.7	-23.5	10.3	-48.7	-13	-35.7	H
3.702	-66.28	Pk	33.2	-28.9	11.3	-50.68	-13	-37.68	V
7.405	-71.5	Pk	35.7	-23.5	10.7	-48.6	-13	-35.6	V
5.550	-68.39	Pk	34.8	-27.3	10.8	-50.09	-13	-37.09	H
5.551	-68.39	Pk	34.8	-27.3	11	-49.89	-13	-36.89	V
Mid Channel, 1880 MHz									
3.760	-65.98	Pk	33.6	-28.9	11.6	-49.68	-13	-36.68	H
7.521	-71.42	Pk	35.7	-23.4	10.4	-48.72	-13	-35.72	H
3.757	-65.42	Pk	33.5	-28.9	11.2	-49.62	-13	-36.62	V
7.518	-70.41	Pk	35.7	-23.4	10.7	-47.41	-13	-34.41	V
5.640	-68.39	Pk	34.8	-27.1	10.8	-49.89	-13	-36.89	V
5.642	-69.12	Pk	34.9	-27.1	10.7	-50.62	-13	-37.62	H
High Channel, 1908.75 MHz									
3.817	-65.94	Pk	33.7	-28.6	11.6	-49.24	-13	-36.24	H
7.632	-70.12	Pk	35.8	-23.3	10.7	-46.92	-13	-33.92	H
3.815	-65.34	Pk	33.7	-28.6	11.3	-48.94	-13	-35.94	V
7.631	-70.16	Pk	35.8	-23.3	11.3	-46.36	-13	-33.36	V
5.724	-69.19	Pk	34.9	-26.7	10.5	-50.49	-13	-37.49	V
5.725	-68.95	Pk	34.9	-26.6	10.4	-50.25	-13	-37.25	H

Pk - Peak detector

Company:	
Project #:	13018918
Date:	9/5/2019
Test Engineer:	39006
Configuration:	EUT Only
Mode:	CDMA BC1 1xEV-DO
Chamber #:	Chamber A

Frequency (GHz)	Meter Reading (dBm)	Det	AF T346 (dB/m)	Amp/Cbl (dB)	Amp/Cbl (dB)	Corrected Reading (dBm)	LIMIT	Margin (dB)	Polarity
Low Channel, 1851.25 MHz									
3.739	-68.47	Pk	33.3	-26.8	9.7	-52.27	-13	-39.27	V
3.752	-68.98	Pk	33.3	-26.8	9.7	-52.78	-13	-39.78	H
5.531	-70.67	Pk	34.7	-25.2	8.6	-52.57	-13	-39.57	V
5.565	-70.53	Pk	34.7	-24.9	9	-51.73	-13	-38.73	H
7.4	-71.19	Pk	35.5	-22.9	7.2	-51.39	-13	-38.39	H
7.465	-71.86	Pk	35.5	-23	7.6	-51.76	-13	-38.76	V
Mid Channel, 1880 MHz									
3.784	-68.82	Pk	33.5	-26.8	9.7	-52.42	-13	-39.42	V
3.786	-68.92	Pk	33.5	-26.8	10.1	-52.12	-13	-39.12	H
5.5	-70	Pk	34.6	-25.2	8.5	-52.1	-13	-39.1	V
5.523	-70.6	Pk	34.7	-25.2	8.7	-52.4	-13	-39.4	H
7.492	-72.13	Pk	35.7	-22.8	7.7	-51.53	-13	-38.53	H
7.509	-66.78	Pk	35.6	-22.8	7.8	-46.18	-13	-33.18	V
High Channel, 1908.75 MHz									
3.674	-68.34	Pk	33.1	-26.8	10.4	-51.64	-13	-38.64	V
3.695	-68.83	Pk	33.1	-26.9	10.5	-52.13	-13	-39.13	H
5.537	-70.96	Pk	34.7	-25	8.7	-52.56	-13	-39.56	V
5.556	-70.66	Pk	34.7	-25	8.9	-52.06	-13	-39.06	H
7.371	-72.27	Pk	35.5	-22.6	7.3	-52.07	-13	-39.07	V
7.393	-71.72	Pk	35.4	-23	7.2	-52.12	-13	-39.12	H

Pk - Peak detector

9.2.3. WCDMA

WCDMA BAND 5

Company:	
Project #:	13018918
Date:	9/5/2019
Test Engineer:	12500
Configuration:	EUT Only
Mode:	WCDMA Band 5 Rel 99
Chamber #:	Chamber B

Frequency (GHz)	Meter Reading (dBm)	Det	AF T344 (dB/m)	Amp/Cbl (dB)	Amp/Cbl (dB)	Corrected Reading (dBm)	LIMIT	Margin (dB)	Polarity
Low Channel, 826.4MHz									
1.627	-67.5	Pk	28.4	-35.5	11.1	-63.5	-13	-50.5	H
2.504	-67.15	Pk	32.4	-35.2	10	-59.95	-13	-46.95	H
3.347	-69.2	Pk	32.9	-33.5	10.6	-59.2	-13	-46.2	H
1.622	-66.71	Pk	28.2	-35.5	12.1	-61.91	-13	-48.91	V
2.499	-67.58	Pk	32.4	-35.3	11	-59.48	-13	-46.48	V
3.340	-69.01	Pk	32.9	-33.4	10.8	-58.71	-13	-45.71	V
Mid Channel, 836.6MHz									
1.645	-67.56	Pk	28.6	-35.5	10.3	-64.16	-13	-51.16	H
2.503	-67.4	Pk	32.4	-35.2	10	-60.2	-13	-47.2	H
3.302	-69.16	Pk	32.8	-33.5	10.7	-59.16	-13	-46.16	H
1.645	-66.41	Pk	28.6	-35.5	10.9	-62.41	-13	-49.41	V
2.501	-67.78	Pk	32.4	-35.3	11	-59.68	-13	-46.68	V
3.283	-68.89	Pk	32.8	-33.7	10.7	-59.09	-13	-46.09	V
High Channel, 846.6MHz									
1.687	-66.2	Pk	28.9	-31.6	12.4	-56.5	-13	-43.5	H
1.694	-65.18	Pk	28.8	-31.6	12.5	-55.48	-13	-42.48	V
2.531	-66.05	Pk	32.6	-30.5	12.1	-51.85	-13	-38.85	H
2.545	-66.63	Pk	32.6	-30.5	11.7	-52.83	-13	-39.83	V
3.383	-68.29	Pk	32.8	-29.1	11.2	-53.39	-13	-40.39	H
3.385	-68.24	Pk	32.8	-29	11.3	-53.14	-13	-40.14	V

Pk - Peak detector

Company:	
Project #:	13018918
Date:	9/11/2019
Test Engineer:	12492
Configuration:	EUT Only
Mode:	WCDMA Band 5 HSDPA
Chamber #:	Chamber A

Frequency (GHz)	Meter Reading (dBm)	Det	AF T344 (dB/m)	Amp/Cbl (dB)	Amp/Cbl (dB)	Corrected Reading (dBm)	LIMIT	Margin (dB)	Polarity
Low Channel, 826.4MHz									
1.657	-66.03	Pk	28.7	-31.6	12.4	-56.53	-13	-43.53	H
1.659	-66.23	Pk	28.8	-31.6	11.7	-57.33	-13	-44.33	V
2.481	-66.73	Pk	32.6	-30.5	11.4	-53.23	-13	-40.23	V
2.482	-66.94	Pk	32.6	-30.5	11.2	-53.64	-13	-40.64	H
3.305	-67.71	Pk	32.9	-29.5	11.3	-53.01	-13	-40.01	H
3.306	-68.08	Pk	32.9	-29.5	10.9	-53.78	-13	-40.78	V
Mid Channel, 836.6MHz									
1.675	-65.63	Pk	28.9	-31.5	12.4	-55.83	-13	-42.83	H
1.669	-65.59	Pk	28.8	-31.6	11.6	-56.79	-13	-43.79	V
3.348	-67.25	Pk	32.8	-29.3	11.1	-52.65	-13	-39.65	V
2.511	-66.33	Pk	32.6	-30.7	11.4	-53.03	-13	-40.03	H
2.511	-66.29	Pk	32.6	-30.7	11.7	-52.69	-13	-39.69	V
3.345	-67.88	Pk	32.8	-29.3	10.4	-53.98	-13	-40.98	H
High Channel, 846.6MHz									
1.674	-72.69	Pk	28.9	-31.5	12.4	-52.89	-13	-39.89	H
1.720	-72.88	Pk	29.5	-31.5	13.8	-51.08	-13	-38.08	V
2.533	-66.97	Pk	32.6	-30.4	12	-52.77	-13	-39.77	H
2.540	-74.13	Pk	32.6	-30.5	11.9	-50.13	-13	-37.13	V
3.395	-74.75	Pk	32.7	-29.1	11.1	-50.05	-13	-37.05	V
3.414	-67.88	Pk	32.8	-29.3	11.7	-52.68	-13	-39.68	H

Pk - Peak detector

WCDMA BAND 2

Company:	
Project #:	13018918
Date:	9/5/2019
Test Engineer:	12482
Configuration:	EUT Only
Mode:	WCDMA Band 2 Rel 99
Chamber #:	Chamber A

Frequency (GHz)	Meter Reading (dBm)	Det	AF T344 (dB/m)	Amp/Cbl (dB)	Amp/Cbl (dB)	Corrected Reading (dBm)	LIMIT	Margin (dB)	Polarity
Low Channel, 1852.4MHz									
3.681	-66.85	Pk	33.2	-28.8	11.7	-50.75	-13	-37.75	V
3.692	-75.75	Pk	33.2	-28.8	11.4	-59.95	-13	-46.95	H
5.585	-68.27	Pk	34.9	-27.2	10.8	-49.77	-13	-36.77	V
5.588	-71.09	Pk	34.9	-27.2	10.8	-52.59	-13	-39.59	H
7.334	-69.51	Pk	35.8	-23.8	11	-46.51	-13	-33.51	V
7.382	-70.83	Pk	35.8	-23.5	10.9	-47.63	-13	-34.63	H
Mid Channel, 1880MHz									
3.642	-65.95	Pk	33.2	-28.8	11.4	-50.15	-13	-37.15	V
3.878	-65.37	Pk	33.6	-28.5	11.7	-48.57	-13	-35.57	H
5.167	-67.79	Pk	34.5	-27.6	11.6	-49.29	-13	-36.29	V
7.812	-70.63	Pk	35.9	-23.3	11.2	-46.83	-13	-33.83	H
10.812	-72.6	Pk	38	-19.2	10.6	-43.2	-13	-30.2	V
10.845	-71.69	Pk	38	-19.7	10.4	-42.99	-13	-29.99	H
High Channel, 1907.6MHz									
3.799	-66.31	Pk	33.7	-28.8	11.1	-50.31	-13	-37.31	H
3.876	-65.5	Pk	33.6	-28.5	12.1	-48.3	-13	-35.3	V
5.235	-67.87	Pk	34.7	-27.4	11.3	-49.27	-13	-36.27	H
6.569	-70.38	Pk	35.8	-25.1	11.4	-48.28	-13	-35.28	V
9.388	-70.7	Pk	36.4	-21.6	10.9	-45	-13	-32	H
11.883	-71.3	Pk	38.5	-19.7	10.5	-42	-13	-29	V

Pk - Peak detector

Company:	
Project #:	13018918
Date:	10/7/2019
Test Engineer:	31300
Configuration:	EUT Only
Mode:	WCDMA Band 2 HSDPA
Chamber #:	Chamber A

Frequency (GHz)	Meter Reading (dBm)	Det	AF T344 (dB/m)	Amp/Cbl (dB)	Amp/Cbl (dB)	Corrected Reading (dBm)	LIMIT	Margin (dB)	Polarity
Low Channel, 1852.4MHz									
2.747	-65.71	Pk	32.4	-30.2	12.7	-50.81	-13	-37.81	H
2.873	-66.62	Pk	32.5	-29.9	12.5	-51.52	-13	-38.52	V
5.979	-67.08	Pk	35.5	-26.2	11	-46.78	-13	-33.78	V
8.368	-69.12	Pk	35.9	-23	11.3	-44.92	-13	-31.92	H
16.555	-71.88	Pk	41.4	-18	11.5	-36.98	-13	-23.98	H
16.564	-71.71	Pk	41.5	-18.1	11	-37.31	-13	-24.31	V
Mid Channel, 1880MHz									
3.045	-65.26	Pk	33.2	-29.9	11.9	-50.06	-13	-37.06	H
3.058	-66.35	Pk	33.3	-29.8	11.8	-51.05	-13	-38.05	V
4.441	-66.2	Pk	33.7	-28.4	11.4	-49.5	-13	-36.5	V
6.448	-69.19	Pk	35.9	-25.1	10.8	-47.59	-13	-34.59	H
13.981	-71.09	Pk	38.6	-19.3	11	-40.79	-13	-27.79	H
14.928	-70.12	Pk	39.7	-19.6	10.2	-39.82	-13	-26.82	V
High Channel, 1907.6MHz									
3.767	-66.45	Pk	33.6	-28.9	11.2	-50.55	-13	-37.55	V
3.841	-66.08	Pk	33.7	-28.7	11.1	-49.98	-13	-36.98	H
7.761	-70.94	Pk	35.8	-23.4	11.2	-47.34	-13	-34.34	V
10.746	-71.51	Pk	37.9	-20	10.3	-43.31	-13	-30.31	H
14.122	-71.12	Pk	38.6	-19.1	11.3	-40.32	-13	-27.32	V
15.263	-71.99	Pk	40.1	-18.6	10.6	-39.89	-13	-26.89	H

Pk - Peak detector

WCDMA BAND 4

Company:	
Project #:	13018918
Date:	9/5/2019
Test Engineer:	12500
Configuration:	EUT Only
Mode:	WCDMA Band 4 Rel 99
Chamber #:	Chamber B

Frequency (GHz)	Meter Reading (dBm)	Det	AF T344 (dB/m)	Amp/Cbl (dB)	Amp/Cbl (dB)	Corrected Reading (dBm)	LIMIT	Margin (dB)	Polarity
Low Channel, 1712.4MHz									
3.405	-64.32	Pk	33	-33.4	10.7	-54.02	-13	-41.02	H
5.244	-67.85	Pk	34.3	-30.2	10.5	-53.25	-13	-40.25	H
6.928	-69.82	Pk	35.8	-27.4	10.4	-51.02	-13	-38.02	H
3.387	-64.32	Pk	32.9	-33.4	11.1	-53.72	-13	-40.72	V
5.232	-67.6	Pk	34.3	-30.1	10.7	-52.7	-13	-39.7	V
6.899	-69.97	Pk	35.8	-27.4	10.4	-51.17	-13	-38.17	V
Mid Channel, 1732.6MHz									
3.474	-65.47	Pk	33.1	-33.2	10.9	-54.67	-13	-41.67	H
5.198	-67.32	Pk	34.2	-30.4	10.4	-53.12	-13	-40.12	H
6.996	-70.03	Pk	35.7	-27.4	10.2	-51.53	-13	-38.53	H
3.448	-64.6	Pk	33.1	-33.2	11.3	-53.4	-13	-40.4	V
5.157	-66.64	Pk	34.3	-30.6	10.6	-52.34	-13	-39.34	V
6.990	-70.19	Pk	35.8	-27.3	10.4	-51.29	-13	-38.29	V
High Channel, 1752.6MHz									
3.468	-65.07	Pk	33.1	-33.3	11	-54.27	-13	-41.27	H
5.291	-67.53	Pk	34.3	-29.8	10.7	-52.33	-13	-39.33	H
6.863	-69.93	Pk	35.8	-27.3	10.5	-50.93	-13	-37.93	H
3.429	-64.79	Pk	33.1	-33.3	11.2	-53.79	-13	-40.79	V
5.272	-68.05	Pk	34.3	-30.1	11	-52.85	-13	-39.85	V
6.840	-70.36	Pk	35.8	-27.4	10.4	-51.56	-13	-38.56	V

Pk - Peak detector

Company:	
Project #:	13018918
Date:	10/7/2019
Test Engineer:	12491
Configuration:	EUT Only
Mode:	WCDMA Band 4 HSDPA
Chamber #:	Chamber A

Frequency (GHz)	Meter Reading (dBm)	Det	AF T344 (dB/m)	Amp/Cbl (dB)	Amp/Cbl (dB)	Corrected Reading (dBm)	LIMIT	Margin (dB)	Polarity
Low Channel, 1712.4MHz									
3.852	-66.37	Pk	33.6	-28.7	11.3	-50.17	-13	-37.17	H
8.049	-70.61	Pk	35.8	-23	11.3	-46.51	-13	-33.51	H
2.270	-66.2	Pk	32	-30.9	11.5	-53.6	-13	-40.6	V
6.275	-69.19	Pk	35.7	-25.3	11	-47.79	-13	-34.79	V
16.549	-72.01	Pk	41.4	-18.2	10.9	-37.91	-13	-24.91	V
17.124	-71.97	Pk	41.1	-19	11.6	-38.27	-13	-25.27	H
Mid Channel, 1732.6MHz									
3.840	-66.81	Pk	33.7	-28.7	11.1	-50.71	-13	-37.71	H
2.534	-67.06	Pk	32.6	-30.4	12	-52.86	-13	-39.86	V
2.637	-66.91	Pk	32.7	-30.2	12	-52.41	-13	-39.41	H
8.000	-70.09	Pk	35.9	-23	11.6	-45.59	-13	-32.59	V
16.367	-72.18	Pk	41.2	-18.5	10.8	-38.68	-13	-25.68	H
16.556	-72.31	Pk	41.4	-18	11.1	-37.81	-13	-24.81	V
High Channel, 1752.6MHz									
2.783	-66.95	Pk	32.5	-30	11.6	-52.85	-13	-39.85	H
3.941	-66.91	Pk	33.5	-28.8	11.6	-50.61	-13	-37.61	H
15.949	-72.19	Pk	40.6	-17.7	10.9	-38.39	-13	-25.39	H
10.634	-72.08	Pk	37.8	-19.7	10.4	-43.58	-13	-30.58	V
2.397	-68.59	Pk	32.3	-30.5	13.1	-53.69	-13	-40.69	V
6.447	-69.34	Pk	35.9	-25.1	11.1	-47.44	-13	-34.44	V

Pk - Peak detector

END OF REPORT

10. SETUP PHOTO

Please see setup photo report 13018918-EP1V1